

Master of Public Health Field Experience Report

Policy Review: School exclusion for non-vaccinated students in Kansas

by

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submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

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2018

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Executive Summary

Analysis of Questions from Kansas Department of Health and Environment School Nurse Workforce Survey regarding School Immunization Exclusion Policies

Background

Immunization plays an important role in keeping people healthy. The CDC has a recommended vaccination schedule that was developed to minimize doctor's visits and to ensure most vaccines are received prior to a child entering school. U.S. laws allow each state to develop their own policies regarding required vaccinations and school entry.

Kansas law requires that all school children be immunized with vaccines designated by the Kansas Department of Health and Environment (KDHE). This statute does allow exemptions on basis of medical or religious grounds (K.S.A. 72-5209 *et seq.*). Local school boards and governing authorities of nonpublic schools are authorized to exclude students who have not been vaccinated according to the requirements (K.S.A. 72-5211a), but state law does not require them to do so. Each district and governing authority may create their own policies regarding exclusion at the individual level. In July of 2016, the Immunize Kansas Coalition, a group of health care providers, health department officials, researchers and educators, distributed a model school immunization policy to all school nurses in Kansas. This group works to improve vaccination rates and protect Kansans against vaccine preventable diseases. The focus of this policy was to develop a written guideline for schools to follow and to have a consistent exclusion date six week after the enrollment date.

Methods

The Kansas Department of Health and Environment annually send a School Nurse Workforce Survey to district Health Coordinators in Kansas. Included in the School Nurse Workforce Survey were eight questions regarding school exclusion policies for nonvaccinated students in Kansas. This survey was sent to district Health Coordinators March of 2018. Responses were evaluated by regions of the state and population density groups. Of the 340 districts this survey was sent, 99 were completed.

The Kansas School Nurse Survey was used to assess the impact of the Immunize Kansas Coalition model school immunization exclusion policy. Answer to questions were analyzed by population density to determine similarities in lifestyles, and by region to assess geographical similarities in answers. These distributions can also be used to target areas that might benefit from more education and information regarding immunization exclusion policies.

Summary of Key Findings

Of the 99 responding school districts 49% recalled seeing the IKC model immunization exclusion policy sent July 2016. Semi Urban school districts were least likely to have reported seeing the IKC policy (30%). South Central Kansas districts had the lowest response rate to seeing the IKC policy (39%). Due to a two-year gap from time the policy was sent until the School Nurse Survey was assessed any staff hired within the last two years may not have seen the IKC policy.

Seven percent of those responding (n=58) thought they might adopt the IKC policy or revise the current policy. Rural and Semi-Urban school districts responded

with no definite plan to revise their policies in response to the IKC policy, however, there were indicators of uncertainty if they would make changes (Rural counties were 32% unsure and Semi-Urban 20% unsure). Dense rural districts reported that 12% of the districts may adopt the IKC policy or revise current policy. Most Southwestern, North Central and Northeastern school districts do not intend to modify their exclusion policies to follow the IKC model policy.

Most districts reported that they had a written immunization policy (63%). Semi Urban school districts had the lowest response to having a written policy (50%). North Central and South-Central school districts had the highest response to having a written immunization policy (70%). Some of the written immunization exclusion policies were adopted as recently as 2015 (37%) while others were adopted between years 2010-2014 (20%) or between years 2000-2009 (20%). However, many exclusion policies were adopted between years 1990-1999 (10%) or prior to 1989 (13%). The School Nurse Survey did not ask if any of these policies have been revised since adoption. An area for improvement includes the 43% of school districts reporting they have not adopted a new policy in more than twenty years.

Next, we asked about the district's policy or practices in actually excluding students who have not received the required immunizations and who do not have a medical or religious exemption. This portion of the survey was answered by 97 responders. Overall, school districts report they exclude students at a rate of 69% that are not immunized or have an exemption. Semi- Urban (90%) and Urban School (85%) districts reported they were most likely to exclude nonexempt under-immunized students. Regionally North Central (79%), South Central (88%) and Southeastern (90%)

school districts were most likely to exclude students. All regions and populations reported at least 50% of the districts exclude students without immunizations or exemptions. There were exceptions to those who should be excluded, this decreases consistent delivery of the policy. Districts report informal, or policy-based exemptions (57%). Rural (63%), Semi-Urban (67%) and Dense Rural (65%) school districts are the most likely to give exceptions to those that should be excluded. Northwest school districts have the highest rate of exceptions (86%). Rural populations have the lowest rate of exemptions (63%). Exceptions are often given on a case by case basis. Based on either the district's written policy or informal practice, the grace period for students to begin receiving required immunizations before they are excluded varied (n=86) (See Fig.1). The majority of responders indicated that the grace period was during the first semester, while 27% of school district exclude students that have not begun to receive immunizations within the first six weeks of school. Some school districts gave individual responses which have been grouped together for similarity. Of these (n=25): 48% do not exclude, 36% of districts exclude during the month of October, 8% of districts report the exclusion date is determined by the principal or school nurse, 4% of districts state the student must be up to date at the end of the first semester, and 4% of districts indicated students have 7 days from enrollment to be up to date on immunizations.

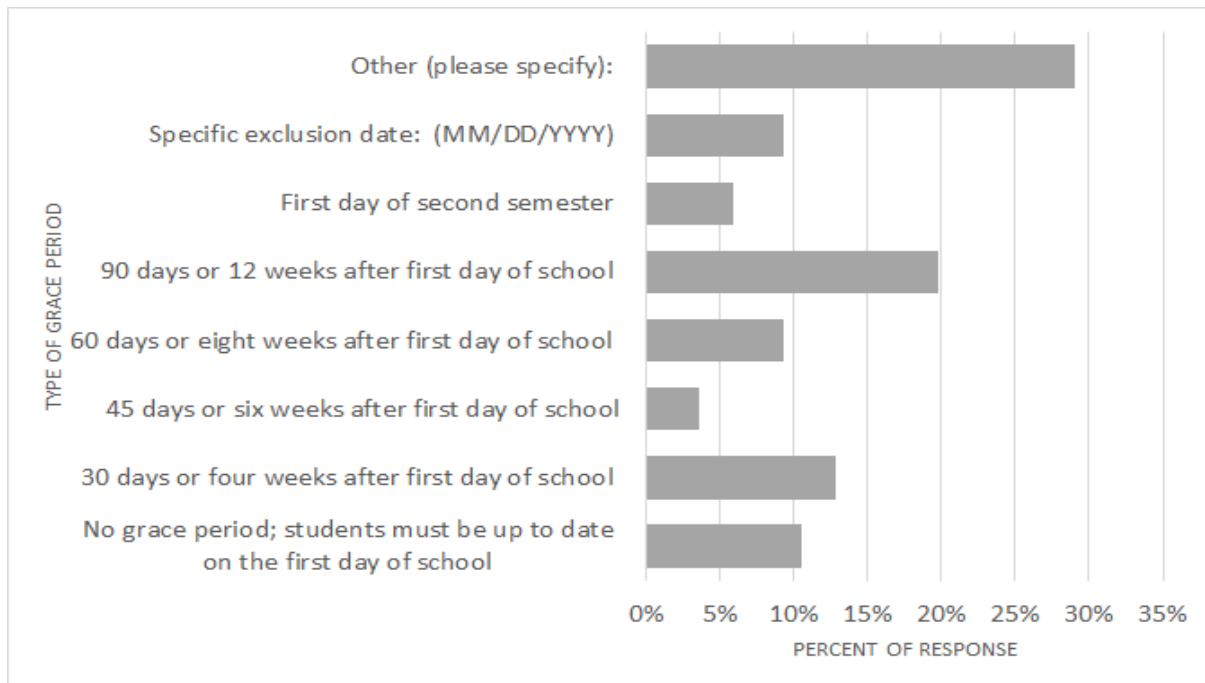


Figure 1: Percentage of response to 2017 School Nurse Workforce Survey regarding how long a grace period for students to begin receiving required immunizations before they are excluded.

Finally, the survey examined the district's intention to modify its immunization exclusion policy in the next 12 months (n=97). Most districts reported they would not be changing their policies (49%), while many districts were unsure if they would (45%). Dense Rural and Semi-Urban school districts do not intend on modifying their policies within the next year. Frontier districts however, were most likely to think about changing their policy (20%). Northwestern districts (16%) intend to modify their exclusion policy. Southeastern Kansas districts do not intend on modifying their policies. Only six districts provided a primary reason why it intended to modify its immunization exclusion policy. Of these districts two districts reported they were making changes because the policy was not being followed, one district wanted to allow students to stay in school if an appointment to be immunized has been made, one wanted to adopt the IKC policy, one

wished to include a specific exclusion date, and one district wanted to create a policy as they do not currently have one.

Recommendations

Government mandates protect the greater good. Immunization recommendations are designed to minimize the spread of vaccine preventable diseases. Schools face the same concerns as any mass gatherings, confined spaces and prolonged exposure. Students further spread disease to the local geographic area when they return home and participate in family and community events. Immunization recommendations change regularly as new research changes standards and as needs change. Further, it is suggestible that as legislation regarding vaccine requirements and mandates are updated that school policies should be reviewed and updated. For the best outcomes, a similar policy for the state of Kansas updated regularly would provide consistency in school districts.

In trying to communicate the importance of vaccinations and updating exclusion policies there are many strategies that can be used. First, the policy should be redistributed to appropriate school officials including: nurses, health coordinators, superintendents and other school administration. This could easily be done multiple times throughout the year, to best reach people. Second, parental input into developing vaccination policies, and school exclusion policies would benefit the school when trying to enforce policies. The Parent Teacher Association (PTA) would be a good target to get parents involved in policy. Finally, an educational outreach program designed with simple information about vaccinations and policies would encourage compliance. Many

people do not know the rate of vaccinated children in their area, including this information might encourage more parents to vaccinate. This outreach program could also include events designed to inform, engage and vaccinate children.

Subject Keywords: Kansas, vaccination, exemption, exclusion, policy

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Chapter 1 - Field Experience Scope of Work

The focus for this field experience was to assess public health policy regarding a model school exclusion policy for non-vaccinated students as distributed by the Immunize Kansas Coalition in 2016. Further, the project assessed policies and practices of exclusion in schools in Kansas and determine if there has been a correlation between policies, practices and immunization rates.

This field experience was performed with the Kansas Health Institute (KHI) in Topeka, Kansas. Kansas Health Foundation predominantly funds the KHI through a multiyear grant. The KHI is an educational research institute focusing on public health policies. The KHI has a mission to improve Kansans health overall through identifying policies and presenting findings to the public at large.

Supervision of this field experience was by Charles Hunt, M.P.H., and Senior Analyst at KHI. Charlie worked previously as state epidemiologist and director of the Bureau of Epidemiology and Public Health informatics at the Kansas Department of Health and Environment. He currently works on projects involving population health issues.



Chapter 2 - Objectives, Activities, and Products

Learning Objectives

- (1) Learn how to analyze quantitative and qualitative data from model school exclusion policy survey using biostatistics, informatics, computer-based programming and software, as appropriate.
- (2) Be able to interpret results of data analysis from school exclusion policy survey for public health research, policy or practice.
- (3) Be able to compare the structure and function of exclusion policies from regional area.
- (4) Be able to apply awareness of cultural values and practices to the design or implementation of model school exclusion policy and its efficacy.
- (5) Learn how to evaluate policies for their impact on public health and health equity if followed.
- (6) Be able to communicate audience-appropriate information regarding school exclusion policy, both in writing and through oral presentation.

Activities Performed

- (1) Work with outside agencies to gather information for the report.
 - Met with Kansas Department of Health and Environment (KDHE) Bureau of Epidemiology and Public Health Informatics to receive data from the Kansas Kindergarten Immunization Coverage Assessment Survey.

Discussed how data would be used, and methods to evaluate the data.

Worked with KDHE Bureau of Family Health.

(2) Collect data from school nurse survey regarding exclusion policies of the school/school system.

- Data received from portion of a statewide school district study in partnership with KDHE Bureau of Family Health.

(3) Analyze data from school nurse survey.

- Utilized Excel to analyze data.
- Utilized Power BI from Microsoft to develop choropleth maps to represent data.

(4) Review statewide exclusion policy. Analyze individual policies of exclusion in several school districts.

- State legislation and school district policies were reviewed. Analyzed if policies were in place in individual districts, what specific exclusion dates were, and if there is a grace period.

(5) Literature review.

- Conducted in-depth literature review on several topics regarding vaccinations.
 - i. History
 - ii. Legislation
 - iii. Policy
 - iv. Anti-vaccination
 - v. Immunology

(6) Review surrounding state policies regarding exclusion policies.

- Referred to state health departments to analyze other states policies regarding exclusion from school for non-vaccinated students.
 - i. Colorado
 - ii. Missouri
 - iii. Oklahoma
 - iv. Nebraska

Products Developed

- Report
 - Authored full report with analysis of data from survey.
- Oral presentation with Power Point slides
 - Presented preliminary report to Immunize Kansas Coalition quarterly meeting April 13th, 2018.
 - Presented preliminary report to Kansas Health Institute Team Leader meeting May 8th, 2018.
- Poster to external audiences
 - Poster *Policy Review: School exclusion for non-vaccinated students in Kansas* presented at Riley Counties "BugAPalooza" April 5th, 2018, Welfald Pavilion, City Park Manhattan, KS.
- Educational Material
 - Authored executive summary to be sent to stakeholders.

Chapter 3 - MPH Foundational Competencies

- Select quantitative and qualitative data collection methods appropriate for a given public health context
 - This study involved both qualitative and quantitative data. I analyzed why some districts did not exclude students through consistent commentary for qualitative data, and for the quantitative data, yes or no questions were converted to sample numbers to develop an idea regarding district policy and its impact on population density groups or health regions.
- Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
 - I utilized Excel and Power BI from Microsoft to analyze and develop my report statistics and maps.
- Interpret results of data analysis for public health research, policy or practice
 - Interpreting the results of the returned survey data was vital to this project. Findings from the data show areas that could be of potential concern should a future outbreak of a vaccine preventable disease occur.
- Apply awareness of cultural values and practices to the design or implementation of public health policies or programs.
 - Understanding why these districts do or do not practice exemption was vital to this report. While many schools may have exclusion policies, not all exclude students. This was important to understanding the community and their cultural practices.
- Evaluate policies for their impact on public health and health equity.

- The main purpose of this study was to evaluate the impact of the recently circulated model policy, by IKC to school districts. Determining if schools received the policy and implemented it was vital to the study. From this point analysis can be made to determine what would improve the policy and support the districts better.
- Communicate audience-appropriate public health content, both in writing and through oral presentation.
 - As part of my field experience I presented my project findings to the quarterly Immunize Kansas Coalition meeting in Wichita, Kansas. IKC drafted the initial policy and I provided them the results of the survey.

Chapter 4 - Report

Introduction

Immunization rates across the United States have been trending downwards since 1998. Vaccine preventable diseases are experiencing periods of outbreaks because of decreased immunization. Attitudes towards vaccination are driven by religion, politics and personal beliefs. Fear about vaccine safety has been a major driver for the decline of immunization rates. There is fear that the vaccines cause other diseases (e.g. Autism), that the adjuvants in the vaccine are not safe (e.g. thimerosal, mercury etc.), that vaccines are unnecessary and that the actual disease is less worrisome than the vaccination. These fears are reinforced with personal testimonies shared through internet usage.

Tracking vaccination levels across Kansas is a vital task of the KDHE. Gaps in vaccinations and exemptions show areas of vulnerability. School policies to exclude students who are not up to date on immunizations are important in the event of an outbreak of a vaccine preventable disease. Having a policy in place to exclude students for their protection is vital to keep the students and surrounding community from spreading the disease freely.

The purpose of this study was to determine the homogeneity of vaccination exclusion policies in Kansas. Analysis was performed to determine if there were differences between public and private districts, population density groups, and regions of Kansas. Public schools follow recommendations from the KDHE regarding required and suggested vaccinations. Private schools may have different entrance policies

related to their affiliation (religious, charter etc.). Population density was used as a focal point as Frontier and Rural counties with less than forty people per square miles may have limited access to medical services and programs for health. As a result of this limited access, it was hypothesized that they may have more lenient policies regarding vaccination for school entrance. In addition, Semi- Urban and Urban communities may have more access to programs and medical services resulting in a stricter policy, or less leniency for exceptions. Finally, Regions of the state were used to determine if there are differences in policy based on location. This could indicate access to medical services or programs is related to distance to service areas or sociocultural differences.

School district health coordinators were contacted March of 2018 regarding school vaccination policies as part of the annual Kansas Department of Health and Environment School Nurse Workforce Survey. Districts were asked if there are current policies, when the policies were enacted, if there are exceptions to the policies, and what the grace period is for a student to get up to date on vaccinations. There was also a number of questions related to the Immunize Kansas Coalitions model policy sent to districts nurses in July of 2016. Districts were asked if they saw the IKC model policy and if they would make changes to current policies based on the recommendations and proposed grace period.

History of Vaccinations

Variolation was the first form of immunization. Variolation consists of inserting the dried crust of a smallpox pustule into a cut in the skin (Stern & Markel, 2005). While the exact location of the first uses of variolation is unknown, the Turks and Chinese

used this method in the fifteenth century to induce an immune response and fight smallpox (Owen, Punt, & Stranford, 2009). This method was brought to Europe by Lady Mary Wortley Montagu in 1718 after she saw first-hand the positive effects of variolation in Constantinople where her husband was stationed as a British Ambassador (Bonanni & Santos, 2011).

In 1798, Edward Jenner, an English physician, developed a hypothesis that those infected with cowpox did not develop smallpox, as was seen in milkmaids at the time (Bonanni & Santos, 2011; Plotkin, 2014; Stern & Markel, 2005). To test this, Jenner inoculated an eight-year-old with fluid from a cowpox pustule (Bonanni & Santos, 2011; Jacobson, St. Sauver, & Finney Rutten, 2015; Stern & Markel, 2005). After exposing the child to smallpox, the child did not develop this disease. Soon this method, called 'vaccination,' was a common practice in Europe and rates of smallpox quickly diminished (Bonanni & Santos, 2011; Stern & Markel, 2005).

Almost a hundred years later, Louis Pasteur attempted to develop a similar inoculation for cholera. Pasteur found that a weakened version (or attenuated) of cholera would produce an immune response (Bonanni & Santos, 2011; Stern & Markel, 2005). He injected chickens with the attenuated version before introducing them to active cholera. The chickens that received the attenuated bacteria had mild symptoms, while those that only received the virulent cholera virus became very ill (Owen et al., 2009). With a second exposure those that had only become mildly ill did not show signs of cholera. Pasteur developed other vaccinations, and in 1885 the first of his vaccinations, for rabies, was delivered to a human (Stern & Markel, 2005).

Immunizations have been successful in eliminating diseases, with smallpox being a prominent example. The last reported case of naturally obtained smallpox was in 1977, in the country of Somalia (Owen et al., 2009). The CDC estimates approximately 95% of the population must be immunized to keep diseases from spreading, especially for airborne diseases (e.g. measles, and chickenpox) (CDC & Ncird, 2013). This 95% percent of immunization provides 'herd immunity,' or protection, to the 5% that have not been immunized due to illness or religious beliefs. When immunization rates drop below 95% the disease exploits the under immunized and outbreaks occur (Buttenheim, Cherng, & Asch, 2013; Jacobson et al., 2015; May & Silverman, 2003; Tolsma, 2015).

Immunology/How immunizations work

The primary goal of the immune system is to identify a foreign pathogen and eliminate it (CDC & Ncird, 2013). When presented with a pathogen, the immune system is stimulated to attack the foreign antigen and eliminate it. B lymphocytes are activated and antibodies are produced that fight the pathogen. During this process the immune system creates memory B cells that will recognize the same pathogen should it be reintroduced (CDC & Ncird, 2013; Owen et al., 2009). This memory response results in a decreased response time to eliminating the pathogen during the second offense. (CDC & Ncird, 2013; Owen et al., 2009). Vaccinations take advantage of this memory by introducing small parts of a pathogen into the system prior to exposure to the pathogen. This system operates in a two-part system: passive immunity, and active immunity.

Passive Immunity

Passive immunity is short term immunity that does not protect the body long-term, it may last a few weeks or months. Most commonly this immunity is gained as part of IgG antibody transmission from mother to child during the last two months of pregnancy (CDC & Ncird, 2013; Owen et al., 2009). The mother passes protective IgG antibodies to the fetus through the placenta and while breast feeding. Some passive immunity is transferred when a patient receives a blood transfusion. However, the benefits of passive immunity are short-lived as antibodies only survive in the body for a few days to a few months before they degrade (CDC & Ncird, 2013).

Active Immunity

Active immunity results from the production of antibodies in response to antigens presented to the body; it can last for years. With active immunity the body is presented with a pathogen and mounts a response (CDC & Ncird, 2013). Memory B cells created from the initial encounter with a pathogen retain IgM and IgG antibodies that recognize and eliminate the disease more quickly than the first encounter (CDC & Ncird, 2013; Owen et al., 2009). Vaccines use this natural method to develop immunological memory. There are two basic kinds of vaccine methods to stimulate the immune system, and a third for a compromised immune system.

Live attenuated viruses are weakened versions of the pathogen and generally do not cause the host to develop the full disease (CDC & Ncird, 2013; Plotkin, 2014). These are used in small amounts to provide an immune response and create the memory B cells (CDC & Ncird, 2013). If the host develops the disease, the reaction is much milder (Plotkin, 2014). Examples of attenuated vaccines are measles, mumps, and rubella. Other vaccines do not use live bacteria.

Inactivated viruses are produced from live bacteria that have been either chemically or heat inactivated, therefore, they do not replicate and do not produce the disease (CDC & Ncird, 2013). Inactivated viruses require additional booster injections for full immunity, this is because the boosters amplify the response and focus antibodies to undergo somatic hypermutations that allow them to be more specific to the disease. Inactivated viruses have shorter immunity because there is little to no cellular immunity, and antibody titers against the disease degrade over time (Bonanni & Santos, 2011; CDC & Ncird, 2013). However, this vaccination will not cause the disease. Examples of inactivated vaccines include cholera, and plague. Another type of vaccines is used for those with compromised immune systems.

Passive vaccines are designed for those children that may be immunocompromised for any reason, or unable to receive a regular vaccination (CDC, 2017b). This type of vaccination is temporary, and the immunity gained quickly is removed from the blood stream. The patient is given antibodies that are specific to the disease, these antibodies degrade over a period months. Examples of this are hepatitis A, and rabies. Vaccine schedules are designed to protect children at as early of an age as possible when they are most immunologically vulnerable (CDC, 2017b).

Vaccine schedule

The CDC offers a 'recommended' immunization schedule (See Appendix 1) (CDC & Ncird, 2013). If followed, a child would receive many of the recommended immunizations prior to entering kindergarten. This was designed to minimize visits over time and to ensure that the schedule is followed (Bromberger, 2017). Many people will not complete the schedule if they delay getting an immunization (Diekema, 2014).

Schools are a site of transmission of many diseases, as children are exposed to many new pathogens (Lai, Nadeau, McNutt, & Shaw, 2014). With high levels of immunization there are fewer instances of vaccine preventable diseases keeping students from school (Diekema, 2014; Lai et al., 2014; Richards et al., 2013). Further, it benefits parents who do not have to miss work to stay home with their children, it keeps medical expenses lower and generally keeps children healthier (Jacobson et al., 2015). This was observed in Minneapolis in 1998 with influenza vaccines; those who received immunizations had 45% fewer days of sick leave, 25% fewer upper respiratory tract illnesses, and 45% fewer doctor's visits than those who were vaccinated (Jacobson et al., 2015).

Vaccine Side Effects

Vaccines are in general very safe. Common side effects are pain at the injection site, redness, swelling and fever (Centers for Disease Control and Prevention (U.S.), 2015). These side effects generally go away within a few days. In rare cases there are more extreme side effects, generally for those allergic to adjuvants in the vaccination or to those with unidentified immune system complications. Other more severe side effects include may include seizures or life-threatening allergies. These side effects are closely monitored through the Vaccine Adverse Events Reporting System (Centers for Disease Control and Prevention (U.S.), 2015; Robertson, 2013). This information is used to continually monitor the efficacy and update immunizations as needed. Parents that have concerns about vaccine safety are often also concerned about adjuvants and that they may cause serious side effects. Aluminum salts and thimerosal are the two biggest concerns. Aluminum salts are added in a minute amount that is not considered

dangerous by the FDA (CDC, 2017a). Thimerosal is an ethyl mercury preservative used to reduce bacterial contamination, parents are concerned about neurological development issues that arise after a thimerosal adjuvant injection (CDC, 2017a).

International Mandates

Internationally, vaccinations have been met with tremendous success. However, once diseases start to dissipate, legislation designed to protect the populace is contested. The earliest Anti-Vaccination Leagues can be traced to England, just after smallpox rates dropped and vaccinations were more successful (Poland & Jacobson, 2012; Tafuri et al., 2014; Williamson, 1984; R. M Wolfe, 2002). In Europe, there have been pocket outbreaks of measles due to low vaccination rates. This was observed in France during an outbreak that occurred in 2008-2012 (Poland & Jacobson, 2012; Robertson, 2013; Verger et al., 2015). Government backed mandates have been successful in promoting vaccinations. Some countries have attempted to encourage vaccination programs through tax benefits, like that in Australia with the "No Jab, No Pay policy" (National Centre for Immunisation Research and Surveillance, 2017; Salmon, MacIntyre, & Omer, 2015). These mandates have also been the subject of opposition.

Once introduced to England the Jenner method of smallpox vaccination was standard for all newborn babies to vaccinate against smallpox. During the mid to late 1860's there were minor outbreaks which led to much stricter legislation regarding vaccination (Thomas, 1980). Unfortunately, the vaccination sometimes caused serious side effects, as well as in some cases, being fatal (Bonanni & Santos, 2011; Stern &

Markel, 2005). During the 1870's, the city of Leicester saw a rise of Anti-Vaccination Leagues that advocated to abolish mandatory vaccination and instead use alternative methods to deal with the disease, like quarantining sick patients (Salmon et al., 2006; Tafuri et al., 2014; Thomas, 1980; Williamson, 1984; R. M Wolfe, 2002). This conflict continued for years with more than 6000 complaints filed with the Board of Guardians (Williamson, 1984). In 1885, Leicester Anti-Vaccination League members rallied together and the legislation for mandatory vaccination was reversed by the Royal Commission (Williamson, 1984).

During 2008-2011 there was a large measles outbreak in Europe; France was particularly effected. A significant factor for the outbreak was declining numbers of vaccinated individuals which lead to 'pocket' outbreaks that totaled more than 20,000 cases (Antona et al., 2013). Children under the age of 12 months were most severely affected. Approximately 5,000 persons were hospitalized, including 1,023 for pneumonia, 27 for encephalitis, and 10 of those patients died (Antona et al., 2013). Eighty percent of those who developed measles were unvaccinated (Antona et al., 2013). Declining numbers of immunized individuals have been attributed to concerns about vaccine safety, difficulty obtaining vaccinations, being opposed to vaccinations in general and general disbelief that the chances of getting the disease are very high.

In 2008, Australia passed legislation stating that parents who vaccinated their children would receive tax benefits (National Centre for Immunisation Research and Surveillance, 2017). Then, a bill referred to as "No Jab, No Pay" passed in 2016 (National Centre for Immunisation Research and Surveillance, 2017). Those that vaccinated received a family tax benefit (Salmon, Sapsin, et al., 2005). Children who

are medically exempt can receive the benefit. This bill essentially removed the ability to claim personal and religious exemptions to be eligible for the benefit. Amounts received in tax benefits can be up to 15,000 AUD per year. This is a significant amount of money that is vital to childcare costs (Salmon et al., 2015).

United States Legislation

In the United States, vaccination laws are largely controlled by the individual states. In the early 1900's two cases in the U.S. Supreme Court supported vaccination laws as they were designed to protect the population not just the individual. The first case was during a smallpox outbreak in Massachusetts and the individual believed his civil liberties were in danger. The second, in Texas, was regarding an unvaccinated individual attempting to enter a public school.

During the 1800's mandatory vaccination laws were enacted in the United States to stop a smallpox epidemic that was sweeping the nation (Lantos, Jackson, & Harrison, 2012; Stern & Markel, 2005). In 1905, a case was brought before the U.S. Supreme Court by Pastor Henning Jacobson stating that the mandatory vaccination law in Massachusetts violated his civil liberties (Lantos et al., 2012; Rials, 2016). The Supreme Court upheld the law in this instance stating the state has the right to impose mandatory vaccination if it is for the benefit of the community (Rials, 2016; Safi et al., 2012).

In 1922, following *Jacobson v the State of Massachusetts*, a school in King, Texas barred entrance to an unvaccinated student. (Diekema, 2014; Rials, 2016). The U.S. Supreme Court ruled that the individual state had the right to impose laws for the safety of the state (*Zucht vs King*) (Diekema, 2014; Rials, 2016). This ruling supported

Jacobson v Massachusetts. Legislation such as this forced many anti-vaccination groups to reevaluate their stance as their view would not be held up in the court system.

Midwest Plains Region Policies

All 50 states allow medical exemptions, and 47 allow religious exemptions in their laws regarding vaccination requirements. States that allow personal exemption or that have easily obtained exemptions have higher exemption rates (Salmon, Sapsin, et al., 2005; Shaw, Tserenpuntsag, McNutt, & Halsey, 2014). There is evidence that parents are obtaining an exemption because it is easier and cheaper than getting the immunizations (Wang, Clymer, Davis-Hayes, & Bottenheim, 2014). In the Midwest Plains Region (Colorado, Nebraska, Missouri, Oklahoma and Kansas), each state has specific guidelines that preclude inclusion in school without vaccination; each also offers exemptions.

Table 1: Midwest Plains Region Exemption policies including grace period, allowable exemptions, how to obtain an exemption, and when exemptions should be renewed.

	Immunization Requirements	Type of Exemption	How to obtain	Expiration
Colorado	W/in 14 days of notification	Medical/Religious/Personal	Online Form	June 30th Annually
Nebraska	Prior to enrollment	Medical/Religious	Notarized forms	Annually
Missouri	Prior to enrollment	Medical/Religious	Certificate	n/a
Oklahoma	Prior to enrollment	Medical/Religious/Personal	Letter	n/a
Kansas	Varies	Medical/Religious	Letter	n/a

Colorado

The Disease Control and Environmental Epidemiology Division (See Appendix 2) allows a fourteen day grace period after a notification that a student is out of compliance with the immunization schedule. If there is no proof of the immunization during the

grace period, then after the period has ended the student is suspended or expelled. Colorado allows medical, religious and personal belief exemptions. For medical exemption, Colorado requires parents to submit a form signed by an advanced practice nurse, physician's assistant, physician licensed for medicine or osteopaths indicating vaccination would be medically contraindicated. This form is required for each school the student attends. Religious exemptions are obtained by having the parent fill out a form indicating religion as the reason for the exemption. This exemption expires annually on June 30th and must be resubmitted every year. Personal belief exemptions are also obtained using a form that can be filled out online by the parent. This must be done annually after June 30th as well. In the event of vaccine preventable disease outbreaks exempt students missing that vaccine will be excluded from school until sufficient time has passed that the health department deems they are safe to return.

Nebraska

The Nebraska Department of Health and Human Services (See Appendix 3) defines an immunization schedule that must be met, or students are not permitted to enroll. Exemptions are allowed for medical and religious reasons. The medical exemption must be signed by a physician, physician assistant or nurse practitioner and state that, in the health care worker's opinion, receiving the immunization would be detrimental to the child or a member of the child's household. The religious exemption requires a notarized affidavit signed by the parent that the immunizations go against the recognized religious tenets. In the case of an outbreak, exempt students will be excluded from school until sufficient time has passed that the state health department deems they are safe to return.

Missouri

The Department of Health and Senior Services in Missouri (See Appendix 4) mandates that all students be immunized with the recommended immunizations prior to enrollment. Students transferring into the school are given 30 days to become compliant. Missouri allows students to be exempt for medical and religious reasons. Medical exemptions require a licensed medical practitioner to sign a certificate that the student would be endangered to receive the immunization or verifying evidence of immunity to the disease. This exemption is done once and carries through the child's school career. In the case of religious exemption, the parents must submit a form from the Department of Health and Senior Services to the school administration, which is placed on the student record and does not need to be renewed. In the case of an outbreak, exempt students will be excluded from school until sufficient time has passed that the health department deems they are safe to return.

Oklahoma

The Oklahoma Department of Health and Human services mandates (See Appendix 5) that any child that does not have a record of immunization must not be allowed admission to any school in Oklahoma (this includes private schools). Oklahoma allows for all three forms of exemption: medical, religious and personal belief. With a medical exemption, the child must have a signed certificate from a medical professional stating that the child is unable to receive vaccinations due to a preexisting condition or fear of endangerment. Religious exemptions may be obtained with a written and signed statement from the parent or religious leader; the statement must explain the specific reasons the immunizations are being rejected. In the personal exemption

the parent must explain the specific reasons the immunizations are being rejected; if the reason is that they lost the immunization records, the claim will be rejected. In the case of an outbreak, exempt students will be excluded from school until sufficient time has passed that the health department deems they are safe to return.

Kansas

The Kansas Department of Health & Environment specifies a list of immunizations required for school entry (See Appendix 6). This list of immunizations is to be presented yearly to the school via a certificate. Any student who has not completed the mandated immunizations may enroll and remain enrolled while completing the immunizations. Exemptions are allowed for medical or religious reasons only. For medical exemptions, the parent must obtain and submit a letter from the physician stating the condition of the child would be such that it would be detrimental to the child to receive an immunization. For religious exemptions the only item needed is a written statement from the parent or guardian stating that the child is an adherent of a religious denomination whose religious teachings are opposed to vaccination. School districts may exclude students from attendance if they have not complied with these requirements. They will receive a notice to the parent indicating why they are excluded and that the parent is eligible for a hearing. Kansas Department of Health and Environment reviews vaccination policies regularly and suggests changes that would be beneficial to state policy. Kansas regularly assesses the state recommendations for vaccinations, this includes proposing a personal belief exemption in 2012, and proposing to add the meningococcal immunization to the recommended schedule in

2016. Due to the potential of changing policies it is vital for schools to review their own policies as state led changes could affect a districts policy.

Exemption Reasons

There are three clear reasons that are reported when people refuse vaccinations for 'personal/philosophical' reasons. These reasons are religious, political libertarians and individuals that believe you can calculate your own risk/benefit. People that refuse vaccinations for personal reasons may choose to do some vaccinations or none.

Religious

Those seeking religious exemptions generally fall into two categories; completely against them or will accept those that do not violate core tenants of the religion. In Afghanistan, Nigeria, and Pakistan it is not uncommon for people to deny vaccinations for religious reasons (Lantos et al., 2012; Robertson, 2013; Wicker & Maltezou, 2014). Instances of polio are higher in these areas as a result and mass outbreaks are not uncommon (Lantos et al., 2012; Robertson, 2013; Wicker & Maltezou, 2014). The common reasons why people are not receiving these immunizations in these areas are that they (a) believe that it is an attempt to subvert the will of God, or (b) they believe that immunizations are a plot from Western countries designed to sterilize and decrease their population (Kata, 2012; Lantos et al., 2012).

Some of the followers of religions like Christian Scientists, Dutch Reformed Church, and Amish do not like immunizations in general, because they believe it violates their religious freedom to be required to receive them (Bowes, 2016; Diekema, 2014; Feikin, 2000; Lantos et al., 2012; May & Silverman, 2003; Rials, 2016). Catholics

are generally not against immunization. Catholics who are vaccine hesitant would prefer if they could produce immunizations without using an aborted fetus stem cell line (Bowes, 2016; Diekema, 2014; Kata, 2012; Lantos et al., 2012). However, the current view of the Catholic church is to support immunization in the view that overall health is more important (Lantos et al., 2012). Efficacy of immunization has not been a major concern with most of these groups.

Political libertarians

Political libertarians are not necessarily against the idea of immunization; in fact, they may choose to immunize (Bowes, 2016; Lantos et al., 2012; McClure, Cataldi, & O'Leary, 2017). What political libertarians do not like is mandatory immunizations (Bowes, 2016; McClure et al., 2017). They believe that government should not be allowed to compel people to receive any type of medical treatments (Diekema, 2014; Rials, 2016). Further, if forced to immunize they believe it constitutes criminal assault (Lantos et al., 2012).

Individuals can calculate the benefit/risk on their own

A large group of individuals who believe they can calculate for themselves the risk/benefit of receiving immunizations. Within this group are those who are naturalists, those who believe that the disease is too rare to necessitate immunizations, and those who are motivated by their own individual research (Dubov & Phung, 2015; Kempe et al., 2011; Wang, Baras, & Buttenheim, 2015). Naturalist philosophy is to not put any artificial substances in the body (Birnbaum, Jacobs, Ralston-King, & Ernst, 2013; Venkatraman, Garg, & Kumar, 2015). Their belief is that adjuvants in immunizations pollute the body and cause illness related to the adjuvants (e.g., mercury, thimerosal

etc.) (Poland & Jacobson, 2012; Ventola, 2016; Yarwood, Noakes, Kennedy, Campbell, & Salisbury, 2005). Also, there is a common belief that immunity from the actual disease is better and safer than an immunization (Wicker & Maltezou, 2014). Many believe the actual disease is better because they have never seen the disease active in a population and have no firsthand knowledge of the diseases devastating effects (Wicker & Maltezou, 2014). Along this line of thinking is the belief that the side effects of a vaccination are worse than the actual disease (Dubov & Phung, 2015; McClure et al., 2017; Wicker & Maltezou, 2014). Finally, this group includes those who rely on their own research to determine if they will immunize (Bauch & Bhattacharyya, 2012; Betsch, Renkewitz, Betsch, & Ulshöfer, 2010). Generally, this research is found through personal testimony from friends and neighbors, healthcare professionals and most recently the Internet.

Role of Web 2.0

Web 2.0 is a common name for the current iteration of the Internet and applies to interactive platform usage, such as social media, blogs and community-powered websites (Dubé, Gagnon, Nickels, Jeram, & Schuster, 2014; Dunn, Leask, Zhou, Mandl, & Coiera, 2015; Faasse, Chatman, & Martin, 2016; Stein, 2017; Venkatraman et al., 2015). Web 2.0 allows users to have a personal experience. They can read testimony from someone else experiencing a similar situation, and it creates a sense of community and provides wisdom from others (A. & McKenna, 2004; Kata, 2012; Tangherlini et al., 2016; Venkatraman et al., 2015). These communities can act like an echo chamber of sorts. Once someone finds an online community that has similar ideas

they are not met with opposing beliefs and their opinions soon mimic one another (Kata, 2012; Tangherlini et al., 2016). There are limitations to Web 2.0; when researching "vaccinations" most of the results come back with negative views towards vaccination with personal testimony (Robert M. Wolfe & Sharp, 2005). However, if "immunizations" is the search term, more evidence-based research from the scientific community is returned (Robert M. Wolfe & Sharp, 2005).

Misinformation is spread quickly throughout Web 2.0 (Peretti-Watel, Larson, Ward, Schulz, & Verger, 2015; Pineda & Myers, 2011; Robert M. Wolfe & Sharp, 2005). One example is from the Wakefield study on autism and the measles immunization. This study was published in 1998 and has had lasting effects. The study proposed that the measles vaccination caused irritable bowel disorder and an infection of the bowels that resulted in autism (Bellaby, 2003; Rials, 2016; Wicker & Maltezou, 2014). The story was pushed into mainstream media and shared all over the internet. Celebrities such as Jenny McCarthy and Tom Cruise went on the news and used this paper to support their beliefs about mandatory vaccinations (Birnbaum et al., 2013; McClure et al., 2017; Robertson, 2013). However, there were several problems with the study. First there were sample error's, the sample of children was of 10-12 children from Wakefield's child's own birthday party, and his child was included (Tafuri et al., 2014). Second, he was unable to replicate his findings of his study (Tafuri et al., 2014). Finally, what he was proposing was a stand-alone immunization (measles is part of an immunization that protects from three diseases: measles, mumps and rubella), which he happened to be developing (Tafuri et al., 2014). The report was retracted, the research was proven fraudulent as it could not be replicated and the sample was incorrect, and it appeared

Dr. Wakefield was attempting to profit from his stand alone vaccination (Kata, 2012; Tafuri et al., 2014; Wang et al., 2015; Wicker & Maltezou, 2014). Later Dr. Wakefield had his medical license revoked. The damage was already done though, and this misinformation continues to thrive.

Outbreaks

With vaccination refusal there is an increased risk of outbreaks of diseases. The diseases that vaccines provide protection for are still active in the U.S.. The rates are low so there is a misconception that they are not common enough for a vaccine. However, outbreaks are still common and those that are under immunized or have refused immunization are at a higher risk when presented with a vaccine preventable disease. For instance, those who do not have a measles immunization when presented with measles are 90% more likely to get measles(Wang et al., 2015). Often large gatherings and interest communities are at greater risk of these outbreaks.

Mass gatherings

There have been many outbreaks of vaccine preventable diseases at places of mass gathering. These include religious pilgrimages like the Hajj (Alqahtani, Alfelali, Arbon, Booy, & Rashid, 2015; Blyth et al., 2010; Shafi, Booy, Haworth, Rashid, & Memish, 2008; Sun, Keim, He, Mahany, & Yuan, 2013). Participants of gatherings like these are at an increased risk of diseases because of excessive crowding, shared accommodations and prolonged exposure (Alqahtani et al., 2015; Blyth et al., 2010). These gatherings result in suffering from air-borne, water-borne and food-borne illnesses (Alqahtani et al., 2015; Sun et al., 2013). The Hajj, an annual pilgrimage to Mecca each Muslim person should make at least once, has been associated with it

outbreaks of cholera, meningococcal disease, influenza disease, pneumococcal disease, tuberculosis and other diseases (Alqahtani et al., 2015; Sun et al., 2013).

While it is recommended that all participants are immunized; each area pilgrims come from have different vaccination requirements. This can result in outbreaks which spread quickly once the pilgrims return home (Robertson, 2013; Vortmann, Balsari, Holman, & Greenough, 2015).

Sporting events such as the Olympics have also been places of disease outbreaks (Alqahtani et al., 2015; Blyth et al., 2010; Shafi et al., 2008; Sun et al., 2013). In 1991 the Olympics in Minneapolis had a measles outbreak after an athlete introduced it (Alqahtani et al., 2015). Within two weeks 24 cases were reported (Alqahtani et al., 2015). Seventy-five percent of the reported measles cases were in unimmunized individuals (Alqahtani et al., 2015). In 2002 the Winter Olympics in Salt Lake City had an influenza outbreak with 36 verified cases. Despite only 36 verified cases, 188 patients reported symptoms (Alqahtani et al., 2015).

The "Happiest Place on Earth," Disneyland in Anaheim, California saw an outbreak of measles in 2014. A total of 111 cases were reported related to this one incident and it spread to 7 states, Canada and Mexico (Bowes, 2016; Phadke, Bednarczyk, Salmon, & Omer, 2016; Ventola, 2016). At least half of these cases were from unimmunized patients, most of whom were medically able but refused vaccination (Phadke et al., 2016; Ventola, 2016). California responded by altering laws allowing philosophical and religious exemptions. Now the only exemptions allowed at public schools in California are for medical reasons (Cataldi, Dempsey, & O'Leary, 2016).

Communities

Common interest communities often experience outbreaks (Bowes, 2016; May & Silverman, 2003; Thompson et al., 2007). This is due to common beliefs regarding immunization. Examples of this can be seen in the Roma population of Bulgaria where immunization rates are extremely low due to poor access to medical care (Butler et al., 2015; Dubé et al., 2014; Wicker & Maltezou, 2014). Immediate needs are prioritized over immunizations in these communities. This is often due to their migratory nature and general distrust of outside groups (Bowes, 2016; Wicker & Maltezou, 2014). Unfortunately, due to this migratory behavior they encounter diseases and transfer them to new communities (Dubé et al., 2014; Wicker & Maltezou, 2014).

The Amish communities in the United States are another example of vaccine hesitant communities (Lantos et al., 2012; Salmon, Omer, et al., 2005). Many Amish communities reject immunization as it is against their religious beliefs (Lantos et al., 2012). This has a large impact in states like Ohio where the Amish population is the majority of 7 contiguous counties in the state (May & Silverman, 2003). There have been rubella, measles and pertussis outbreaks in many Amish communities in recent years (Hinman, Orenstein, Williamson, & Darrington, n.d.; Phadke et al., 2016; Shaw et al., 2014).

Charter schools run the risk of outbreaks due to higher rates of exemption than those reported in public schools (Birnbaum et al., 2013; Faasse et al., 2016; Lai et al., 2014). Many of these exemptions are personal belief-based or fall into the 'calculate own risk/benefit' theme (Birnbaum et al., 2013; Constable, Blank, & Caplan, 2014). During 2008 a measles outbreak in San Diego California at a charter school with a personal belief exemption of 11% resulted in 48 cases in the area (Birnbaum et al.,

2013; Diekema, 2014; Lantos et al., 2012). The surrounding areas where the charter schools are located tend to have high rates of under immunization, due to similar belief practices priming them for large outbreaks (Birnbaum et al., 2013; Constable et al., 2014; Faasse et al., 2016; Lai et al., 2014).

Methods

The Kansas Department of Health and Environment (KDHE) Bureau of Family Health distributes an annual school nurse survey that tracks the school nurse workforce, management of students with chronic diseases, health screenings data and immunization policies (Appendix 7). In 2016 the Immunize Kansas Coalition presented a model school immunization policy to school nurses (Appendix 8). Kansas law requires immunization for certain diseases for children in child care settings and enrolled in public and private schools. The law allows for religious and medical exemptions, but not personal belief or philosophical exemptions. Questions were added to the school nurse survey to determine if school districts adopted the policy, assess characteristics of school district policies and practices regarding exclusion, and to determine current reasons why school districts are or are not excluding students. The KDHE also sends an annual survey to individual school nurses that has two purposes: gather a sample of student records to monitor vaccination levels and to review exclusion and exemption policies.

Data received from the KDHE Kansas Kindergarten Immunization Coverage Assessment included percentages of religious exemptions, percentages of medical exemptions and the percentages of districts with exclusion policies for school years:

2014-2015, 2015-2016, and 2016-2017. The religious and medical exemptions were reported as number of students with exemption type (medical or religious) divided by the total number of students in the district. The exclusion policy was reported as number of schools reporting "yes" to having an exclusion policy divided by the total number of schools in the district. Each of these subtypes can be further restricted to public or private schools or both public and private schools.

School district health coordinators, identified by the KDHE Bureau of Family Health, to Kansas school districts were asked to complete a school nurse survey in the month of March 2018. This survey was conducted to assess the school nurse workforce, management of students with chronic diseases and health screening data and attempt to evaluate the potential impact of the Immunize Kansas Coalition (IKC) model school immunization policy distributed July. This survey has generally been distributed annually. After a 2-year gap this survey will return to regular annual distribution.

The school nurse survey was distributed electronically via Qualtrics online. An initial email was sent with detailed information about the survey, including goals and the purpose, it also included a link to complete the survey. This link remained active for four weeks. During this time respondents received biweekly emails as reminders to complete the survey. After this time period, non-responding districts were contacted via phone calls. Phone calls were to ensure materials were received and address any issues respondents may have encountered.

A total of 8 questions relating to the IKC model school exclusion policy were asked, taking approximately 15 minutes to complete out of the entire survey. There

were mainly 'closed' questions which prompted specific responses. This was done to provide consistent data that could minimize bias in response based on 'open' questions.

Responses were categorized three ways for analysis. First, they were categorized by public and private schools. Second, by population type Frontier counties (<5.9 people per square mile), Rural counties (6-19.9 people per square mile), Dense Rural (20-39.9 people per square mile), Semi-Urban counties (40-119.9 people per square mile), and Urban counties (>120 people per square miles). See Appendix 10 for map representing population types. The final category was based on the Kansas Department of Health districts, Northwest, Southwest, North Central, South Central, Northeast, and South East. See Appendix 11 for map representing the KDHE districts.

ANOVA and Unpaired T tests will be used to determine if there are statistical differences between the categorical variables to those responding yes on the immunization questions of the school nurse survey. Tests were performed with $p \leq 0.05$ being significant. If the observed test statistic is greater than the critical value, the null hypothesis can be rejected and show the difference in the populations.

Results

2017-2018 KDHE School Nurse Workforce Survey

Emails were sent to school district representatives inviting them to participate in an annual school nurse survey, within the survey was a series of question related to current school immunization exclusion policies, grace periods and the Immunize Kansas Coalition model school immunization exclusion policy (See Appendix 7 for the survey and Appendix 8 for the policy) distributed in July 2016. Within Kansas, 390 districts (292

public, 98 private) were contacted with 26% (99) of districts (88 public and 11 private) participating, representing 54.3% of counties (57 out of 105 counties). The sample population type was stratified by population density (See Appendix 10 for map representing population type, further referred to as 'population type') and by KDHE District Office Boundaries (see Appendix 11 for map of boundaries, further referred to as 'region').

This survey included the following question with answer choices of yes or no:

In July 2016, the Immunize Kansas Coalition (IKC) – a group of Kansas providers, health department officials, researchers and educators working together to improve vaccine rates and protect Kansans against vaccine-preventable diseases – distributed a model school immunization exclusion policy to all school nurses in Kansas. The letter and model policy are posted on the Immunize Kansas Coalition website at www.immunizekansascoalition.org/schools.asp. Do you recall receiving this information?

All 99 participants responded to this question: 49% (49) indicated “yes” and 51% (50) indicated “no” (Fig. 1a). However, Private schools responded more frequently to seeing the IKC policy (Fig.1b).

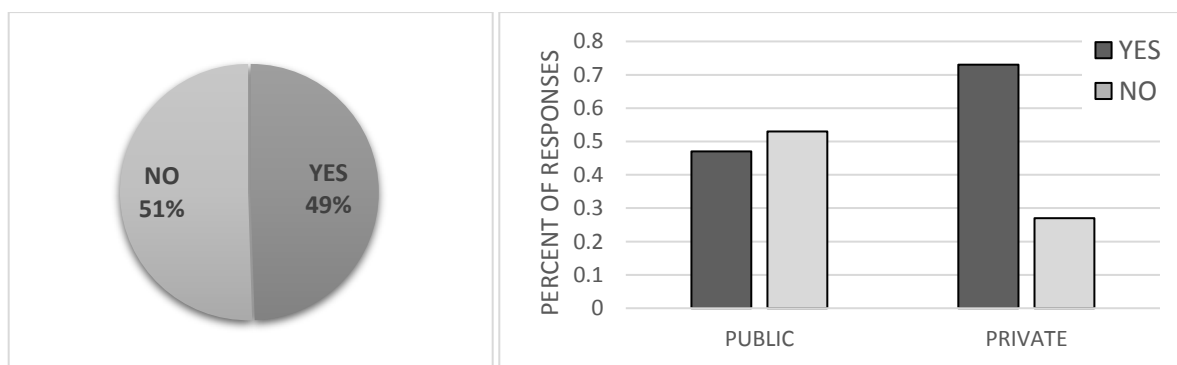


Figure 1a and 1b: Percentage of school representatives that recall seeing the model Immunize Kansas Coalition school exclusion policy sent in July 2016, by response and school type in the 2017 Kansas School Nurse Survey. n=99

Survey participants were asked "Does your district have a written immunization exclusion policy?" All 99 participants answered either, "yes, no and not sure" (not sure is reported as UNK on graphs) (Fig. 2a). Both public and private schools responded that more than 50% of the districts had seen the policy (Fig.2b).

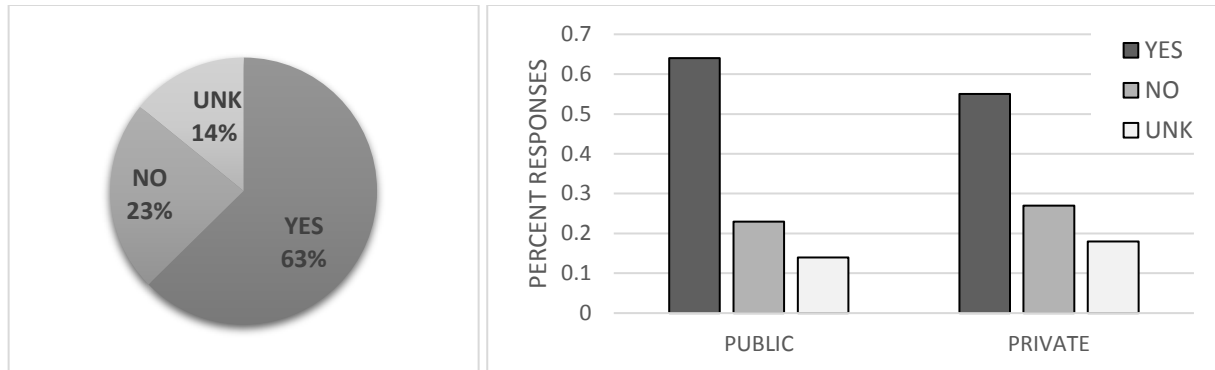


Figure 2a and 2b: Percentage of responses: all responses and by school type to the 2017 Kansas School Nurse Survey question 'Does the district have a written exclusion policy?' n=99

Participants were asked to respond with month, date, and year when their districts policy for exclusion was adopted. Only 30 respondents answered this question. More than half (57%) of responses indicated the school district exclusion policy was adopted within the last ten years (Fig. 3). However, 23% of districts reported their policies were adopted more than twenty years ago.

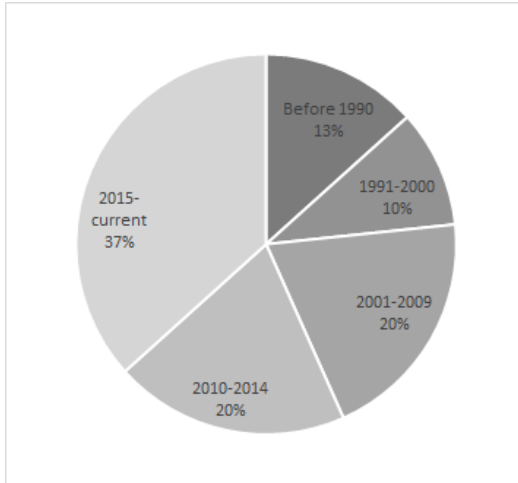


Figure 3: Percentage of responses to 2017 Kansas School Nurse Survey requesting dates district exclusion policies were adopted. n=30

Approximately half of the participants (n=58) answered the question *"Did your district either adopt or revise its immunization exclusion policy in response to receiving the IKC Model Policy?"* Options for response were 'yes', 'no' and 'unsure' (unsure is shown as 'unk' on graphs). Few districts reported that they would revise the current immunization exclusion policy to the IKC policy (7%) (Fig. 4a). Public school districts indicated there may be some districts planning on adopting or revising their policies based on the IKC model exclusion policy (7%) (Fig. 4b).

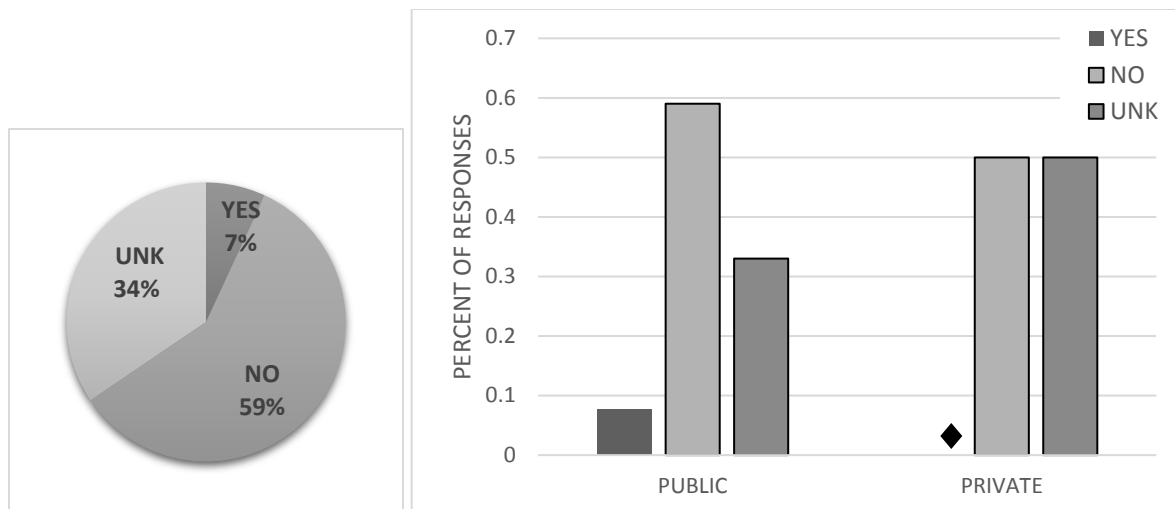


Figure 4a and 4b: Percentage of responses to 2017 Kansas School Nurse Workforce Survey question "Did your district either adopt or revise its immunization exclusion policy in response to receiving the IKC Model Policy", overall response and by response and school type. n=58. Diamonds indicate that there were no districts responding with that answer.

In general, districts responding to the question *"With or without a grace period, does your district exclude students who have not received the required immunizations and who do not have a medical or religious exemption?"* (n=97) indicated that they do exclude non-vaccinated nonexempt students (69%) (Fig. 5a). Private school districts have a higher percentage of districts that exclude (73%). Public school districts report that 68.6% of districts exclude non-vaccinated nonexempt students (Fig. 5b).

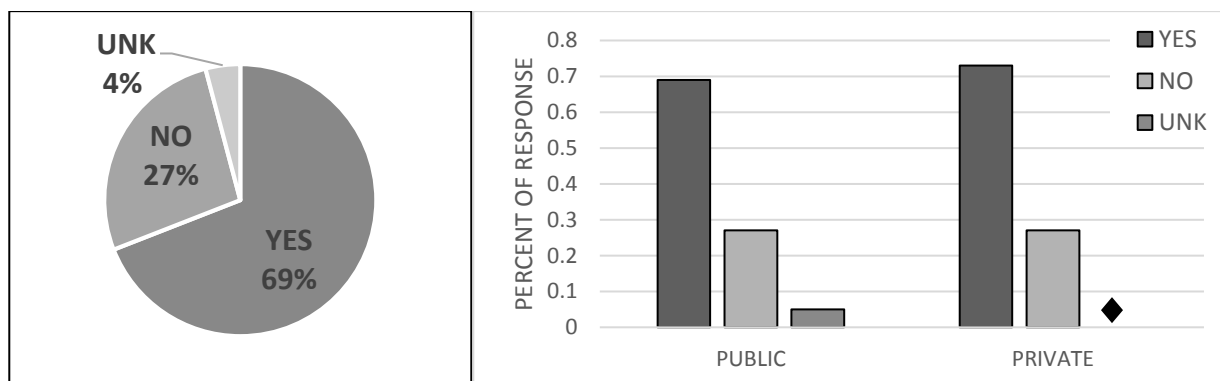


Figure 5a and 5b: Percentage of responses to 2017 Kansas School Nurse Workforce Survey question "With or without a grace period, does your district exclude students who have not received the required immunizations and who do not have a medical or religious exemption?", by school type and response. n=97. Diamonds indicate that there were no districts responding with that answer.

Survey respondents (n=67) answered the question "*Outside of a grace period, does your district allow for exceptions to excluding students, either informally (e.g., case by case basis) or by policy (e.g., parents or guardians sign a statement that they understand the risks, etc.)?*" Many districts allow for exceptions to excluding students who do not have exemptions and are not up to date on vaccinations (Fig. 6a). Public schools reported a higher likelihood of allowing these exceptions (Fig. 6b).

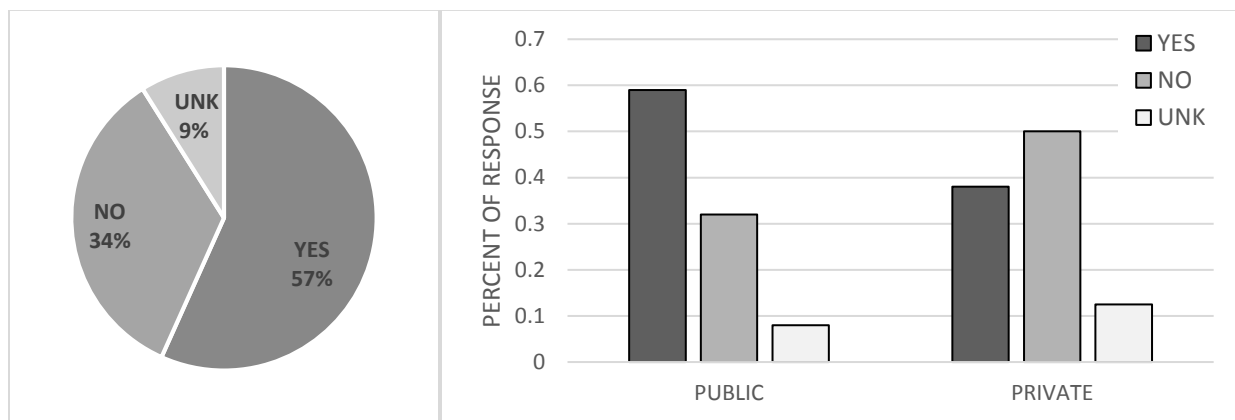


Figure 6a and 6b: Percent of responses to 2017 School Nurse Workforce Survey question "Outside of a grace period, does your district allow for exceptions to excluding students, either informally (e.g., case by case basis) or by policy (e.g., parents or guardians sign a statement that they understand the risks, etc.)?", by school type and response. n=67. Diamonds indicate that there were no districts responding with that answer.

Survey respondents were asked "*According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded?*"(n=86) Responses are shown in Figure 7. Most of the responses (56%) indicate that the grace period is during the first semester (Fig. 7). Students not up to date on vaccinations and without medical/religious exemptions are excluded within the first six weeks of school in 27% of school district (Fig. 7). Private schools reported the shortest grace period with 25% of these districts requiring students to be up to date upon the first day of school, and 25% requiring up to date vaccinations within 30 days. Public school districts allow longer grace periods with

20% requiring students to being up to date by the end of the first semester

(Fig.8). School districts replying 'other' gave individual responses which have been grouped together for similarity. Of districts that respond 'other' (n=25) the following responses were obtained: 48% do not exclude, 36% of districts exclude during the month of October, 8% of districts report the exclusion date is determined by the principal or school nurse, 4% of districts state the student must be up to date at the end of the first semester, and 4% of districts indicated students have 7 days from enrollment to be up to date on immunizations. Eight respondents selected specific dates for the grace period while 6 respondents specified dates. In addition, 1 response or 16.6% was recorded for each of the following: (1) between 1-2 weeks, the 1st day of second semester, 30 days after the start of school, responded 9/20/2017, 10/1/2017, and 10/19/2017.

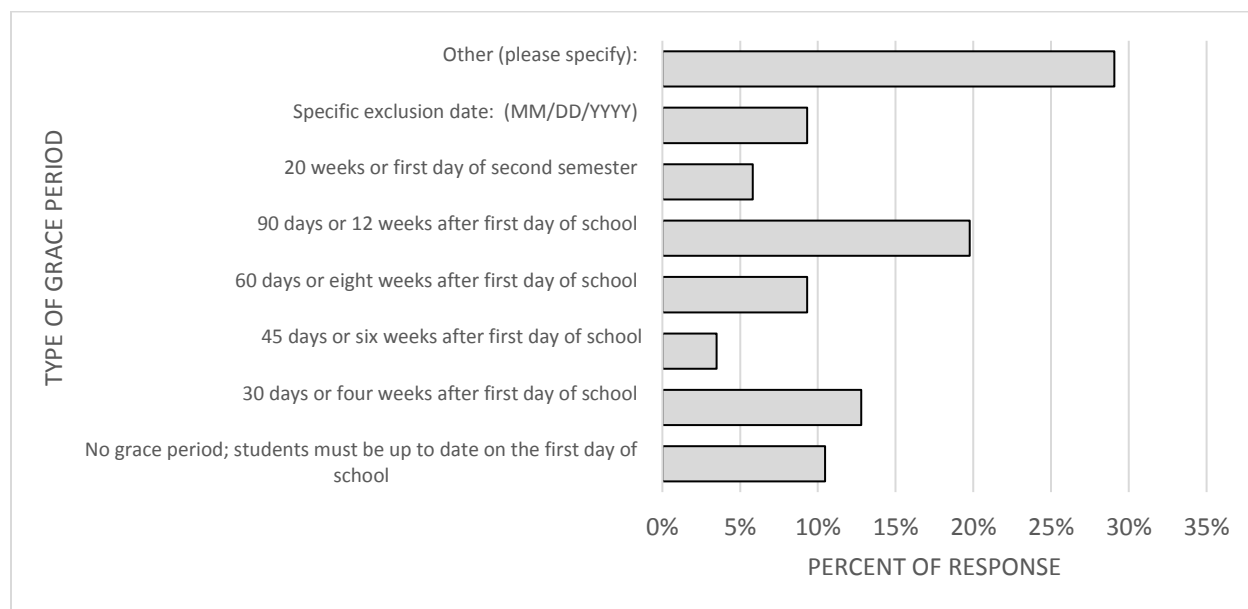


Figure 7: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded? Please select the option that most closely matches your school's grace period." n=86. Diamonds indicate that there were no districts responding with that answer.

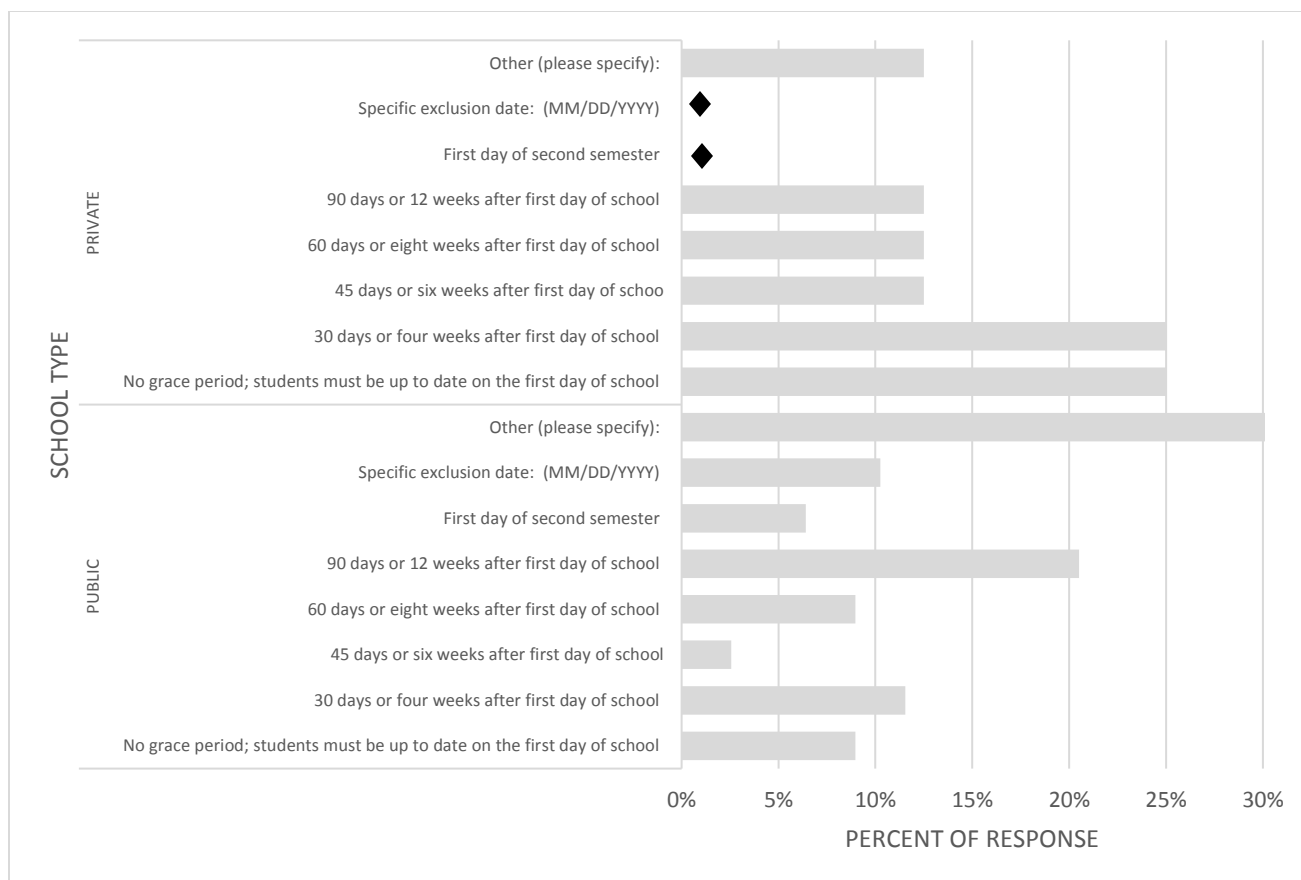


Figure 8: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded? Please select the option that most closely matches your school's grace period." by school type and response. N=86. Diamonds indicate that there were no districts responding with that answer.

Survey participants were asked, *"Does your district intend to modify its immunization exclusion policy in the next 12 months?"* Options for response were 'yes', 'no', and 'not sure' (respondents answering no and not sure were skipped to the next question, unsure are reported as unk on graphs) (n=97). Districts reported they would not be changing their policies (49%) and many districts were unsure if they would (45%) (Fig.9a). Respondents answering 'yes' to changing the policy were asked why they planned on changing 100% (6) responded with 2 districts stating they were changing the policy as their policy was not being followed, one district was changing the policy to allow students to stay in school when doctor's appointments exceeded the exclusion

date, one was changing the policy to follow state recommendations, another was changing the policy to put a specific date in it and one was changing the policy by putting one in place. Private districts are least likely to change their policy, 60% (Fig. 9b). Private districts are least likely to change their policy, 60% (Fig. 9b).

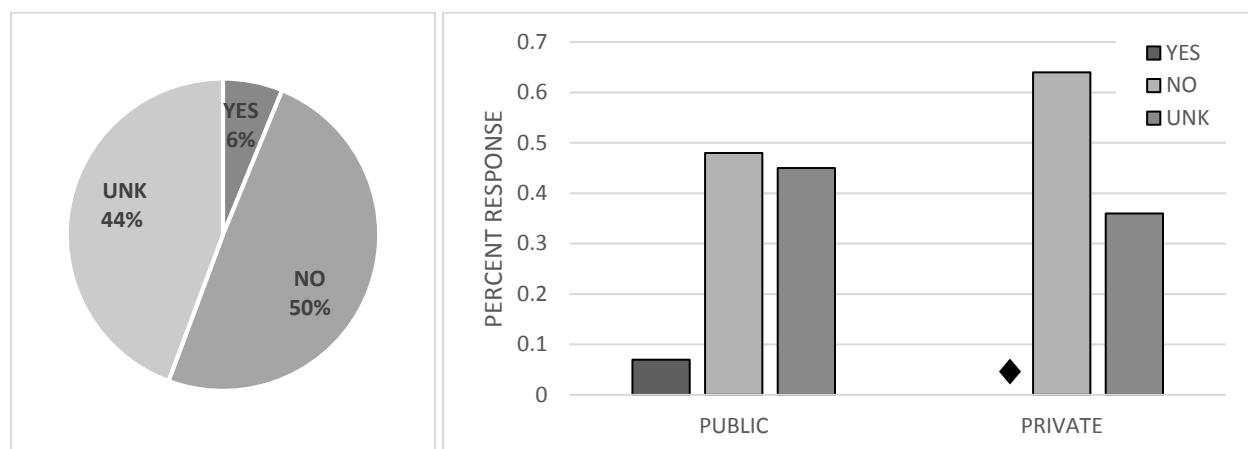


Figure 9a and 9b: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "Does your district intent to modify its immunization exclusion policy in the next 12 months?" by response and school type. n=97. Diamonds indicate that there were no districts responding with that answer.

KDHE Survey results stratified by state regions.

Regions of the state may express different attitudes toward these questions as distance to medical services would be similar. Therefore, the answers were grouped by regions as indicated in the Materials and Methods. The North Central Kansas and North Eastern Kansas 'regions' responded to the School Nurse Survey with the highest rate. The lowest response rate to the School Nurse Survey came from Southeastern Kansas. See figure 10 for response map by region and figure 11 for response rate by region.

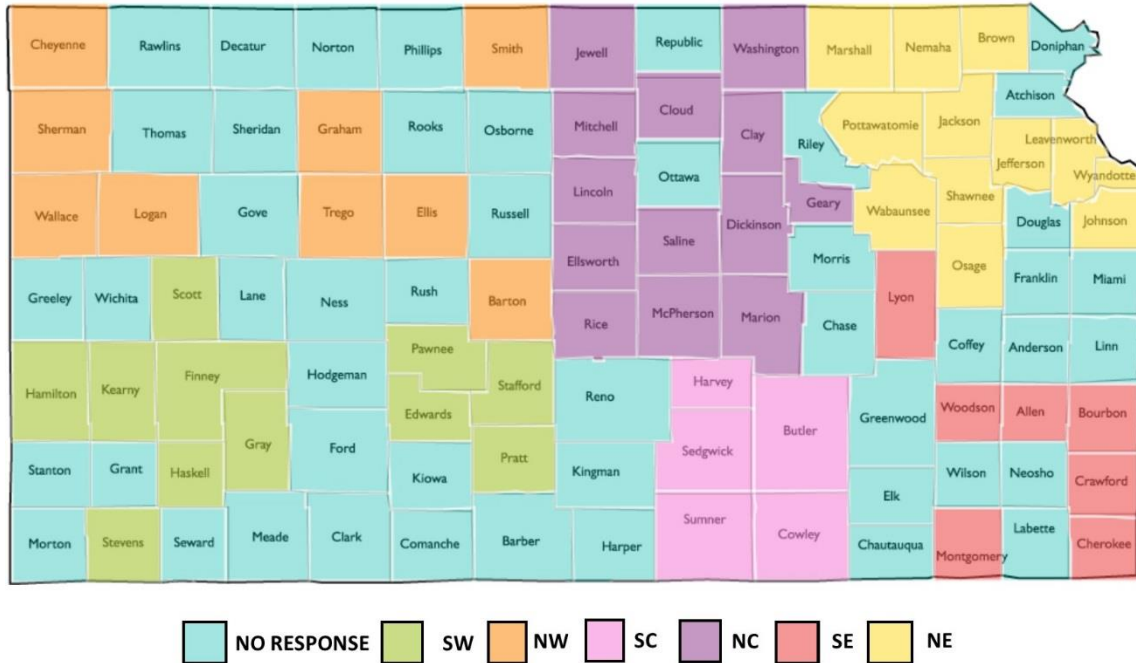


Figure 10: Response rate to 2017 school year Kansas School Nurse Workforce Survey by regions of Kansas.

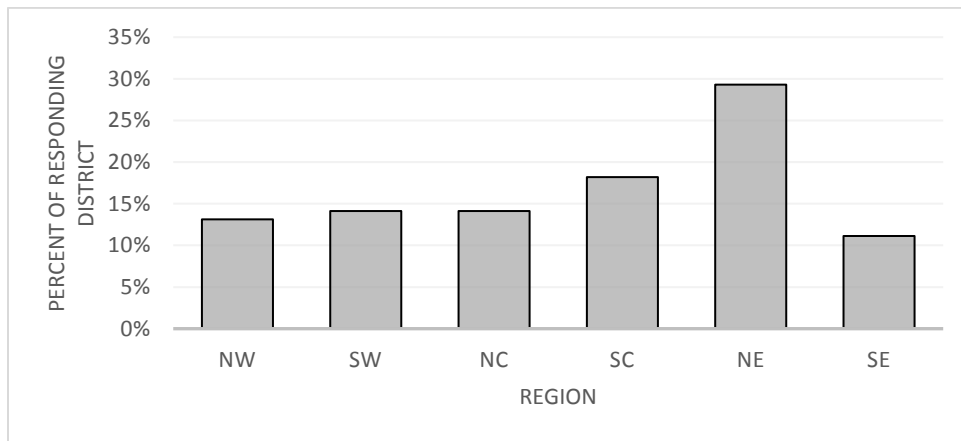


Figure 11: Percent of responses to 2017 Kansas School Nurse Survey by state regions.

Responses to which counties saw the IKC policy varied by region (Fig. 12).

South central Kansas indicated they were the least likely to see the policy. Other regions indicated at least 50% had seen the policies.

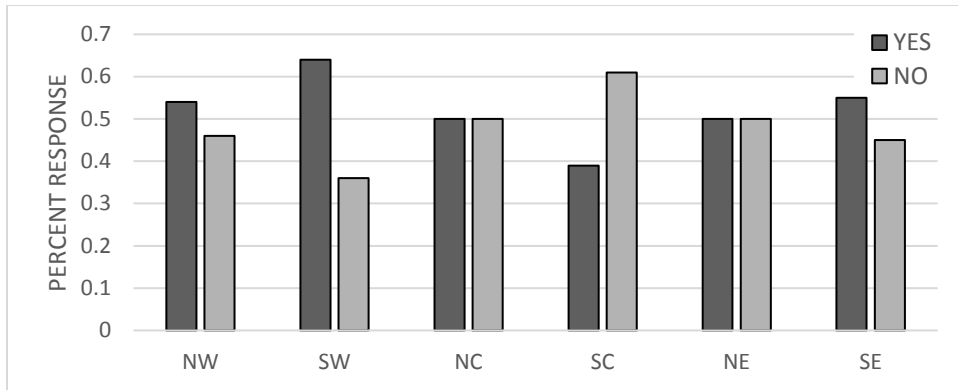


Figure 12: Response rate by region type and response, to seeing the IKC model policy sent July 2016, in the Kansas School Nurse Survey.

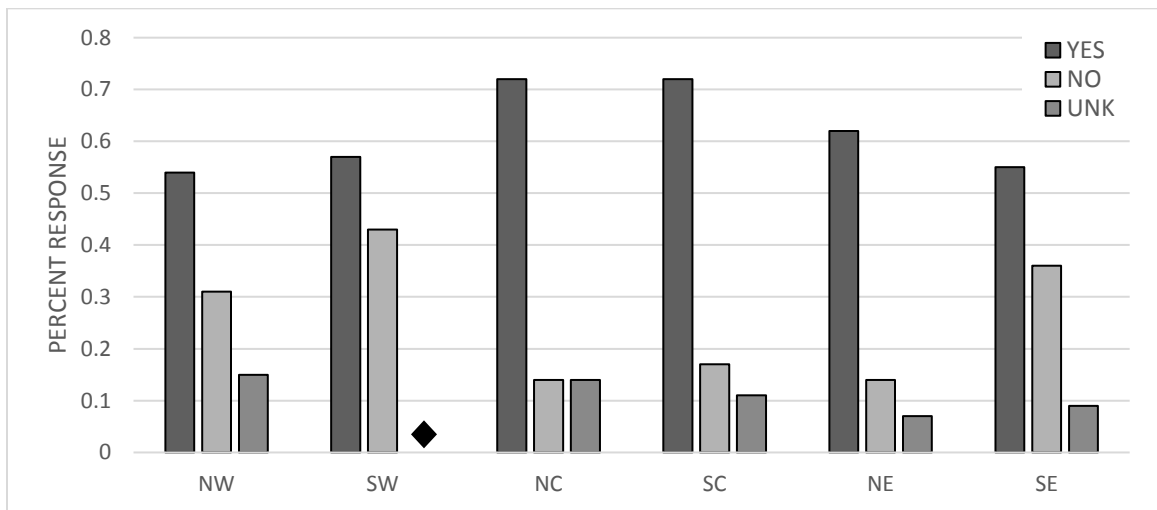


Figure 13: Percent of responses to the 2017 Kansas School Nurse Survey question: "Does your district have a written exclusion policy" by region and response. Diamonds indicate that there were no districts responding with that answer.

Northwest, South Central and South eastern districts responded most frequently they may change their current policies regarding exclusion (Fig. 14). Southwest, North Central and Northeast districts had no responses of yes to changing their policies.

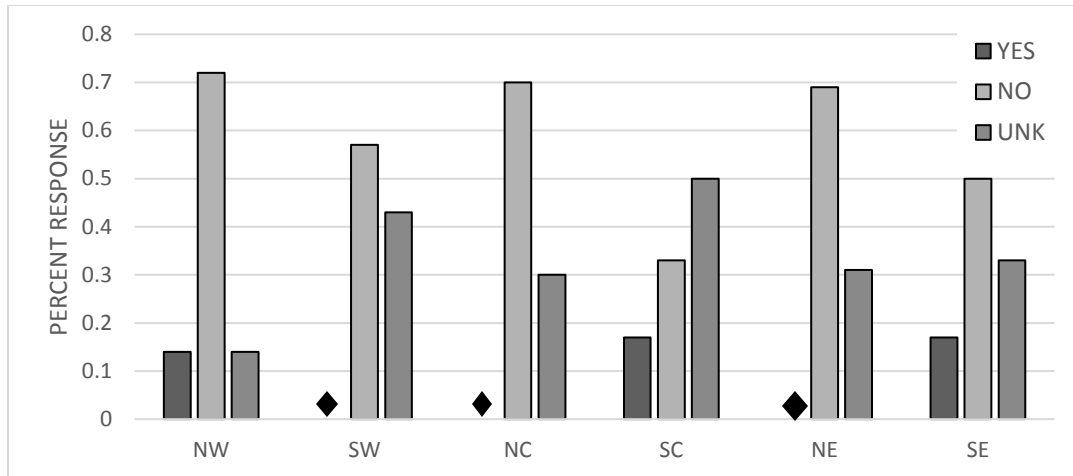


Figure 14: Percentage of responses to 2017 Kansas School Nurse Workforce Survey question "Did your district either adopt or revise its immunization exclusion policy in response to receiving the IKC Model Policy", by response and region. Diamonds indicate that there were no districts responding with that answer.

The districts which responded to excluding students not up to date on immunizations and without exemptions for medical/religious reasons were higher in South Central (89%) and Southeastern (90%) districts (Fig. 15). Western Kansas districts reported they excluded at a lower rate (Southwestern 50% and Northwestern 53%). The Northwest districts more frequently allow exceptions to exclusions (86%). Eastern Kansas districts had the lowest reported exceptions (Fig. 16).

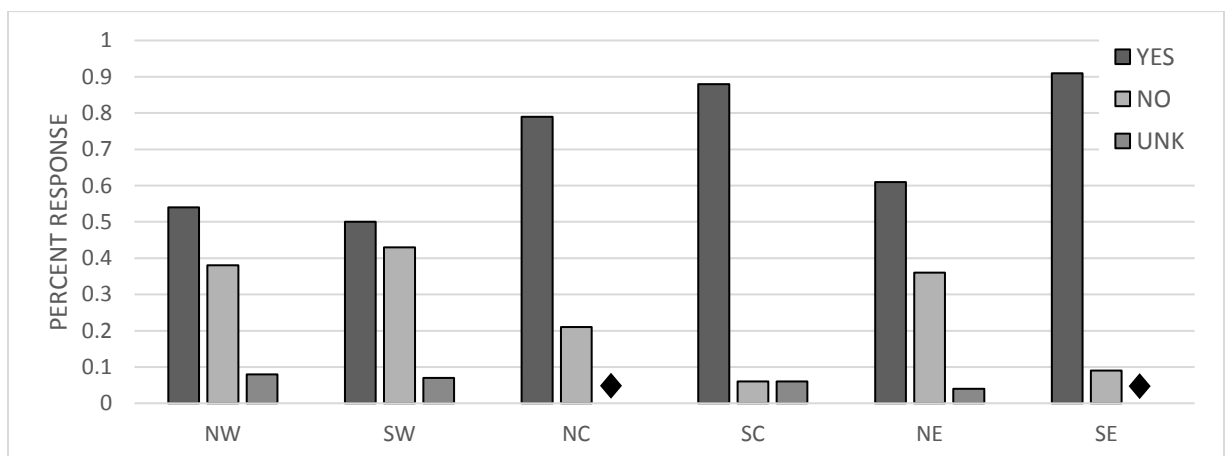


Figure 15: Percentage of responses to 2017 Kansas School Nurse Workforce Survey question "With or without a grace period, does your district exclude students who have not received the required immunizations and who do not have a medical or religious exemption?", by region and response. Diamonds indicate that there were no districts responding with that answer.

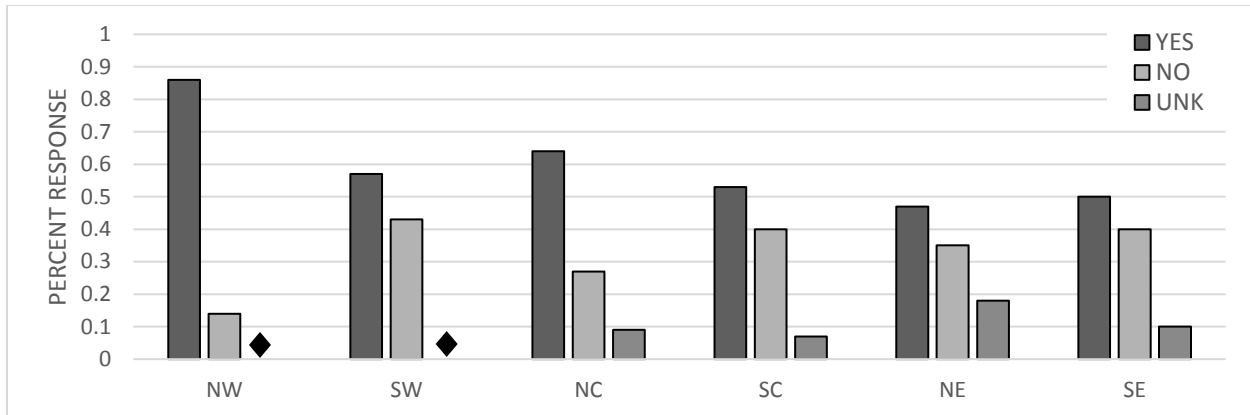


Figure 16: Percent of responses to 2017 School Nurse Workforce Survey question "Outside of a grace period, does your district allow for exceptions to excluding students, either informally (e.g., case by case basis) or by policy (e.g., parents or guardians sign a statement that they understand the risks, etc.)?", by region and response. Diamonds indicate that there were no districts responding with that answer.

Southeast Kansas districts generally allow students 90 days to become up to date on vaccinations (44%) (Fig. 17). North Central Kansas also allows for 90-day grace periods (25%). Northeastern Kansas districts report 28% allow a 30-day grace period to get up to date on vaccinations.

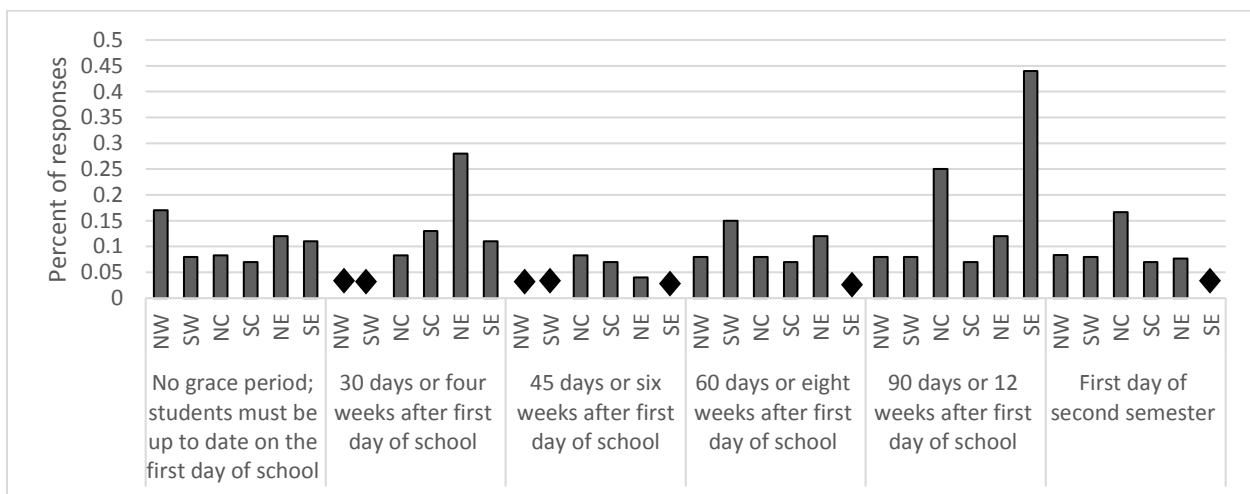


Figure 17: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded? Please select the option that most closely matches your school's grace period." by response and region. Diamonds indicate that there were no districts responding with that answer.

Northwest districts indicated they would be most likely to change their policies regarding immunization exclusion (15%) (Fig. 18). Southeastern Kansas had no indication they would change their policy.

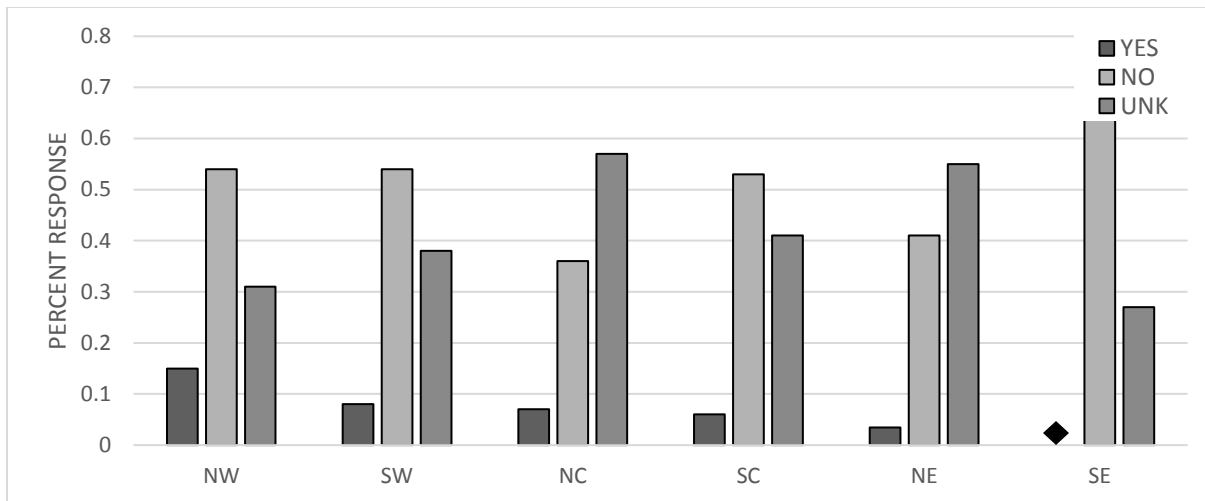


Figure 18: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "Does your district intent to modify its immunization exclusion policy in the next 12 months?" by response and region. Diamonds indicate that there were no districts responding with that answer.

School Nurse Survey stratified by population density

We also evaluated the data based on population density. The sample 'population types' for the School Nurse Survey had the highest response from Dense Rural, Semi Urban, and Urban counties. Frontier counties had the lowest response to the School Nurse Survey. See figure 5 for the response map by population type and figure 8 for response rate of counties in population type. Responses to seeing the IKC policy varied by population type (Fig. 19 and 20).

Frontier counties had the highest response to seeing the IKC policy. Semi Urban counties were least likely to have seen the policy (Fig. 21).

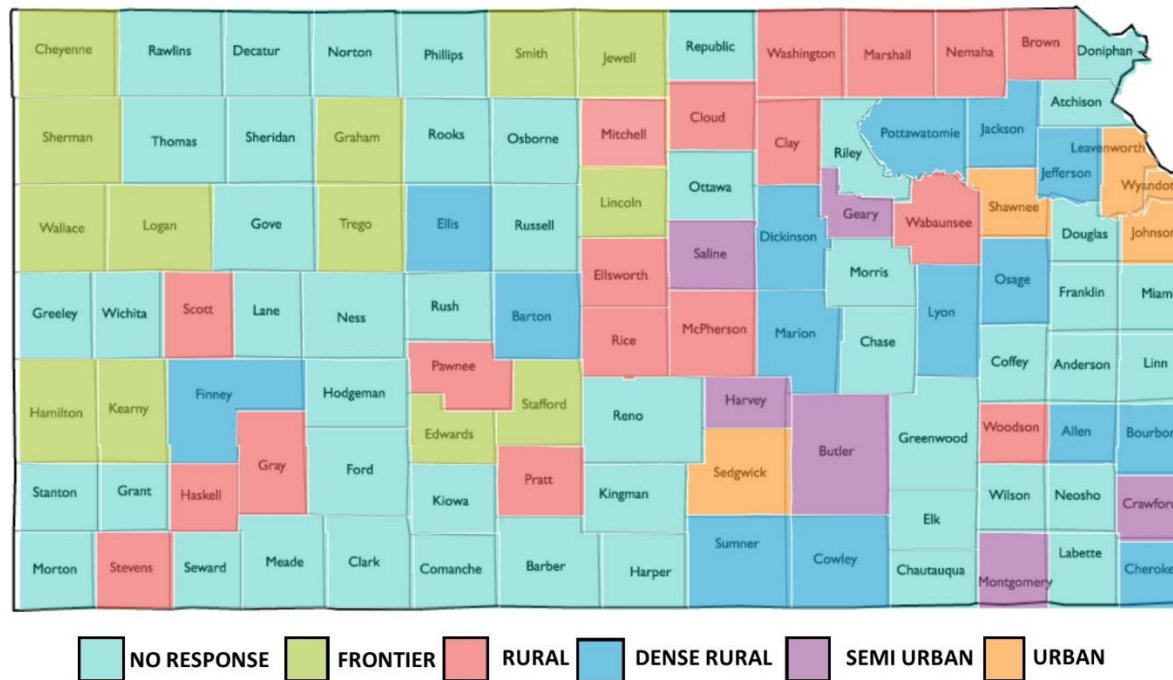


Figure 19: Response rate by population density to Kansas School Nurse Survey 2017-2018 school year

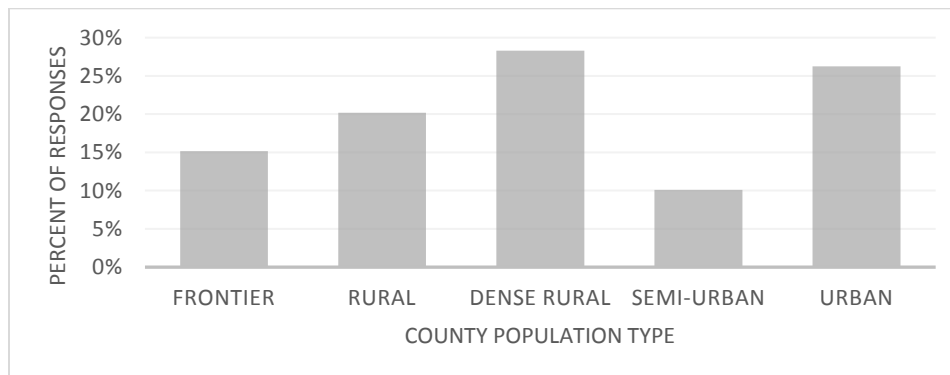


Figure 20: Percent of responses to 2017 Kansas School Nurse Survey by population density type.

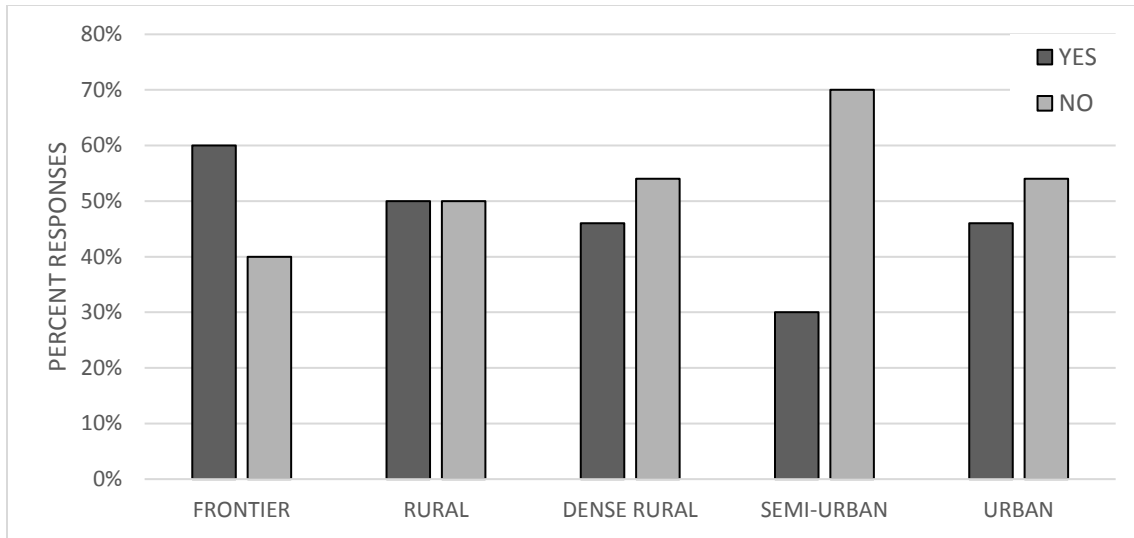


Figure 21: Percent of response by population type and response type, to seeing the IKC model policy sent July 2016, in the 2017 Kansas School Nurse Survey.

In addition, at least 50% of the districts had a written exclusion policy (Fig. 22). Urban counties reported the highest number of written exclusion policies. However, Frontier, Dense Rural and Urban counties were most likely to report they may revise their immunization exclusion policy (Fig. 23). Rural or Semi-Urban districts give no indication they plan on revising their immunization exclusion policy.

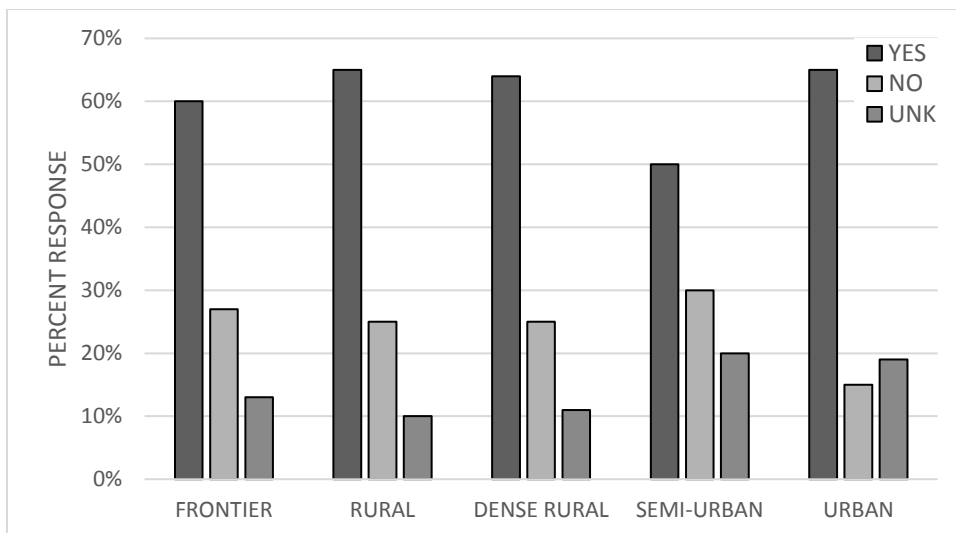


Figure 22: Percent of responses to the 2017 Kansas School Nurse Survey question: "Does your district have a written exclusion policy" by population type and response.

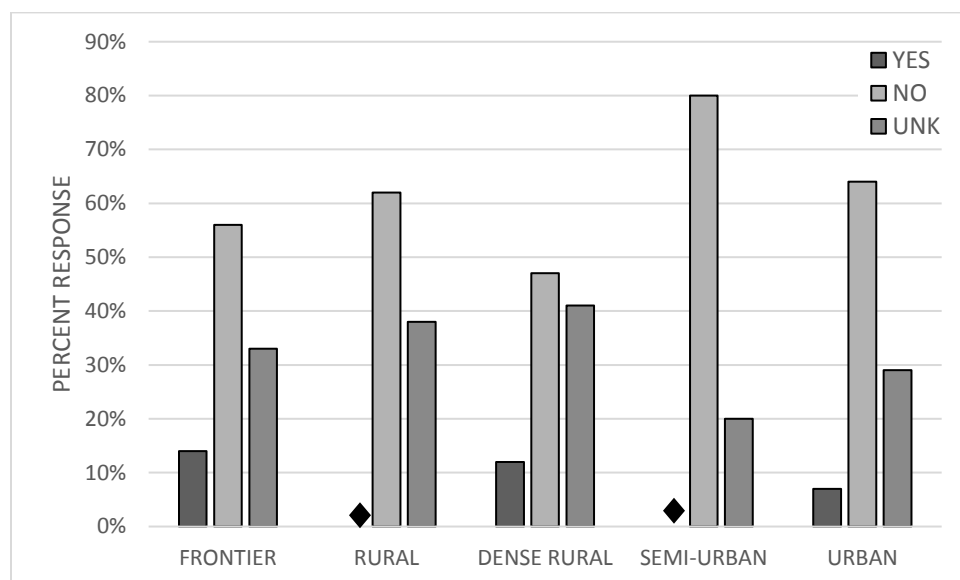


Figure 23: Percentage of responses to 2017 Kansas School Nurse Workforce Survey question "Did your district either adopt or revise its immunization exclusion policy in response to receiving the IKC Model Policy", by response and population type. Diamonds indicate that there were no districts responding with that answer.

More respondents from Semi-Urban districts (90%) indicated that they do exclude students who are not up to date on immunizations or do not have medical/religious exemptions (Fig. 24). Conversely, Frontier populations are least likely to exclude students that are not up to date or that do not have medical/religious exemptions. Districts from Rural (64%), Dense Rural (65%) and Semi-Urban (66%) counties are most likely to allow exemptions to exclusion policies (Fig. 25). Urban county districts are least likely (45%).

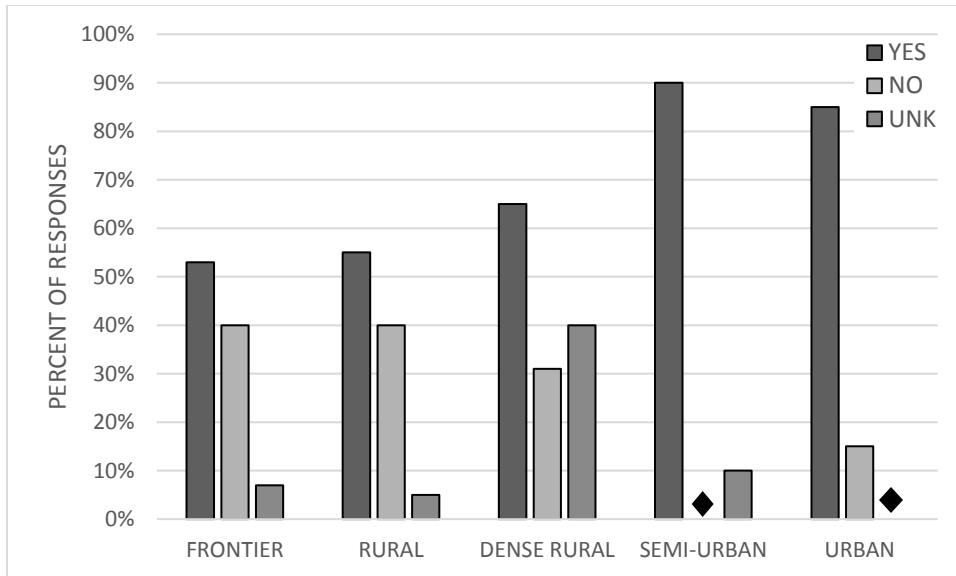


Figure 24: Percentage of responses to 2017 Kansas School Nurse Workforce Survey question "With or without a grace period, does your district exclude students who have not received the required immunizations and who do not have a medical or religious exemption?", by population type and response. Diamonds indicate that there were no districts responding with that answer.

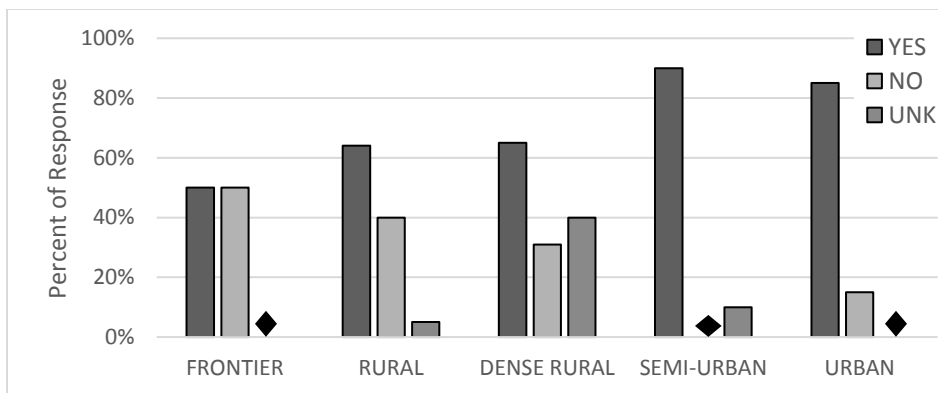


Figure 25: Percent of responses to 2017 School Nurse Workforce Survey question "Outside of a grace period, does your district allow for exceptions to excluding students, either informally (e.g., case by case basis) or by policy (e.g., parents or guardians sign a statement that they understand the risks, etc.)?", by population type and response. Diamonds indicate that there were no districts responding with that answer.

Frontier districts are most likely to require students being up to date on immunization by the first day of the semester (29%) (Fig. 26). Urban counties generally require students being up to date within 30 days (26%). Dense Rural counties generally allow students to wait 90 days to become up to date on immunizations (25%). Dense Rural and Semi Urban districts do not intend on changing their policies (Fig. 27). Frontier districts reported 20% may change their policy.

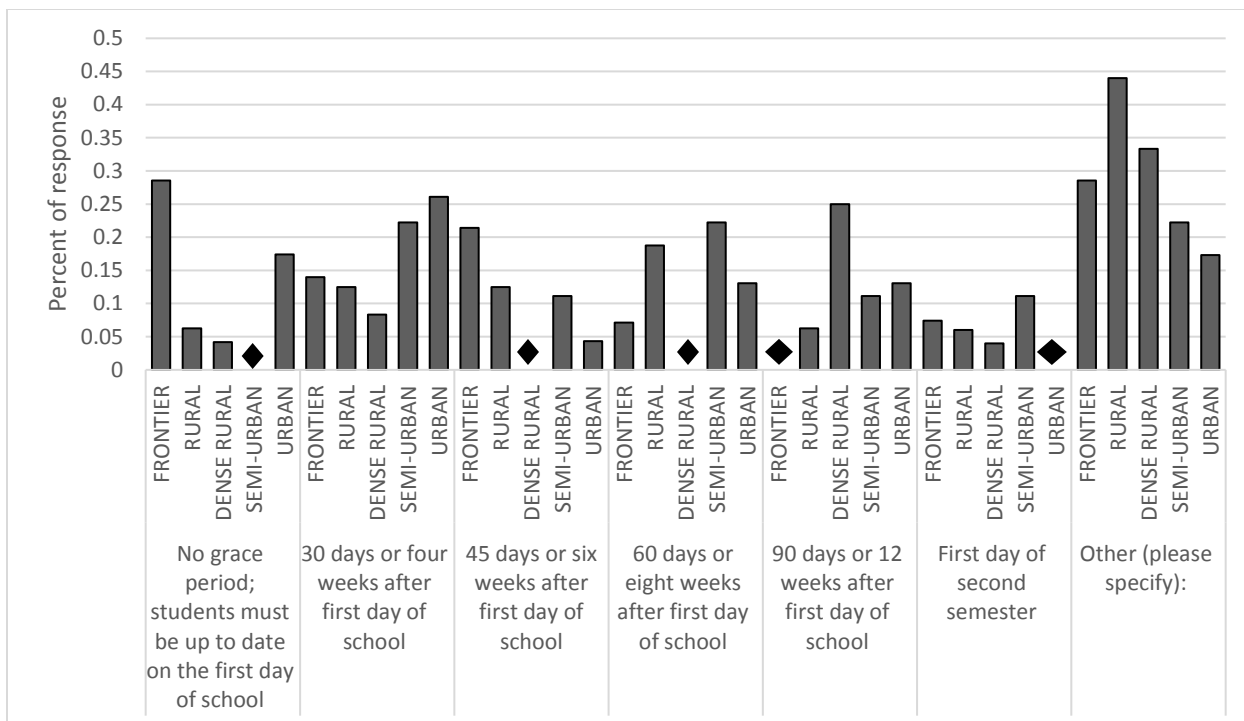


Figure 26: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded? Please select the option that most closely matches your school's grace period." by response type and population. Diamonds indicate that there were no districts responding with that answer.

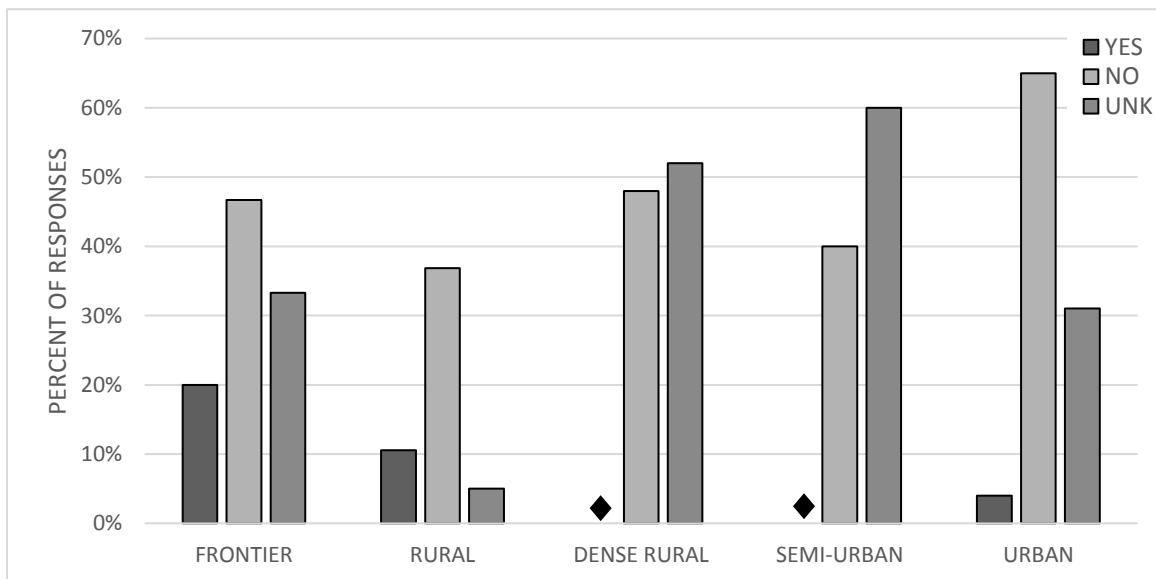


Figure 27: Percent of responses to 2017 Kansas School Nurse Workforce Survey question "Does your district intent to modify its immunization exclusion policy in the next 12 months?" by response and population type. Diamonds indicate that there were no districts responding with that answer.

Kansas Department of Health and Environment Kindergarten Vaccination Coverage Survey

To evaluate the need for state exemption policies the Kindergarten Immunization Coverage Assessment from the KDHE was analyzed over a three year period. Letters were sent to school nurses inviting them to participate in the vaccine coverage assessment survey and provide vaccination records annually in school years fall 2014, 2015, and 2016 covering three school years (Fig. 28). The response rate varied with 9219, 8328, and 6955 records received 2014, 2015, and 2016 respectively. In 2015 and 2016 100% of counties were represented while in 2014 had 97.14%.

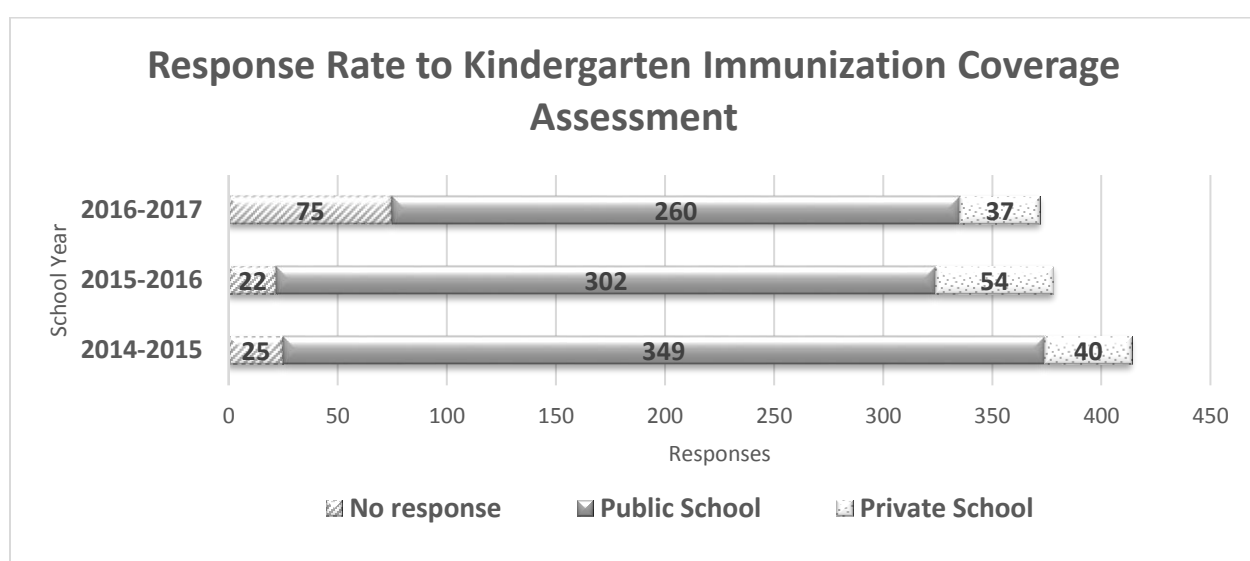


Figure 28: Survey response to the Annual KDHE Kindergarten Immunization Coverage Assessment school years 2014-2017

The vaccinations that are required for school entry (DTaP5, Polio4, MMR2, Var2, and HepB3) had coverage levels above 87% between the 2014-2017 school years. The completed (DTaP5-Polio4-MMR2-Var2-HepB3) series ranged from 79-83% with an average of 82%. The suggested vaccinations for school children (HIB3, PLV4, and HepA1) coverage was ~88%. Overall coverage of all vaccinations both required and recommended vaccinations was 88.48% (Table 2).

Table 2: Kansas Kindergarten vaccination averages by school year. (2014-2017)

YEAR	DTAP5	POLIO4	MMR2	VAR2	HepB	5 4 2 2 3	HIB3	PLV4	HepA1	AVERAGE
2014-2015	88%	89%	88%	88%	97%	83%	90%	82%	91%	88%
2015-2016	89%	88%	89%	87%	97%	83%	92%	83%	91%	89%
2016-2017	89%	88%	86%	89%	96%	79%	92%	82%	93%	88%

Exemption and Exclusion Policy

Each year during the 2014-2017 period schools were invited to report their exemption data. During 2014, 816 schools were contacted 764 responded (93.60%), 666 public and 98 private schools representing 102 counties. During 2015, 813 schools were contacted 774 responded (95%), 676 public and 98 private schools representing 105 counties. During 2016, 815 schools were contacted 550 responded (67.5%), 500 public and 50 private schools representing 90 counties.

In the study period, schools were surveyed to report data on the unvaccinated kindergarten exemption data (Fig. 29). On average 1.74% of all kindergartners had an exemption during the study period. The 2014 school year had a total of 542 kindergarten exemptions. The 2015 school year had a total of 608 exemptions. The 2016 school year had 477 kindergarten exemptions.

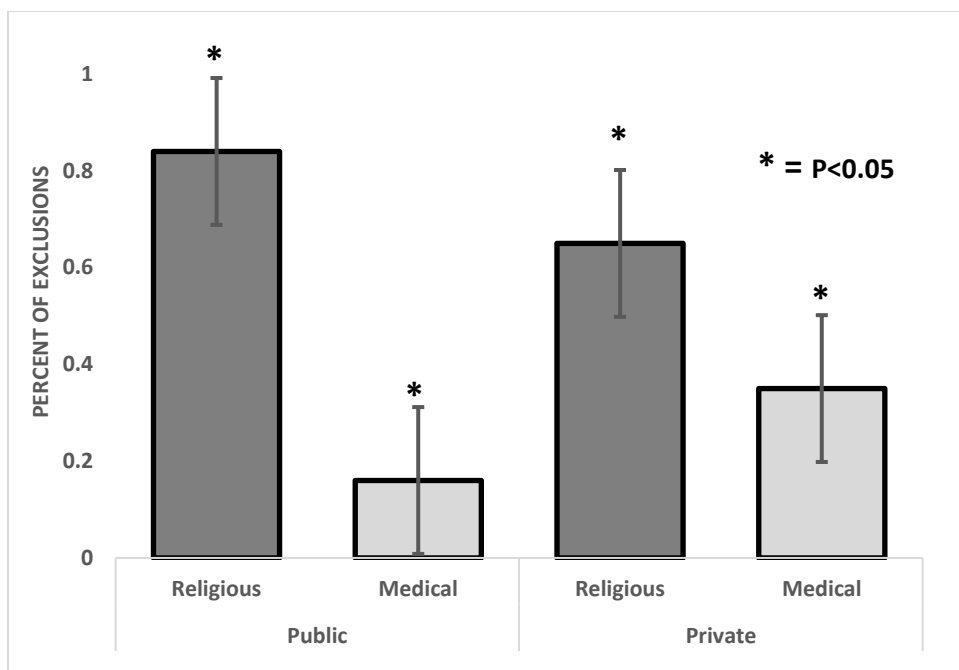


Figure 29: Percent of Kansas kindergartner exclusions by year, school type and exclusion type as reported in the KDHE Kansas Kindergarten Immunization Assessment 2014-2017. Significance of public vs private ($p \leq 0.05$) is indicated by *.

Statewide 9.93% of students are not up to date with vaccinations and did not have exemptions during 2014-2017 and as a result are eligible for exclusion. In 2014-2015, 10.5% of kindergarten students were eligible for exclusion. In 2015-2016, 9.08% of kindergarten students were eligible for exclusion. In 2016-2017, 10.2% of kindergarten students were eligible for exclusion

In 2014, 10.5% of kindergartners were eligible for exclusion. Despite a slight drop to 9.08% in 2015, kindergartners eligible for exclusion returned to 10.2% in 2016. Maps of kindergarten students eligible for exclusion by county and year are in Appendix 10. In all three years of the study, 9.93% of kindergarteners that should be excluded was highest in Urban areas and lowest in Frontier counties (Fig.30). In 2016, there was an increase in Urban counties of students that should be excluded.

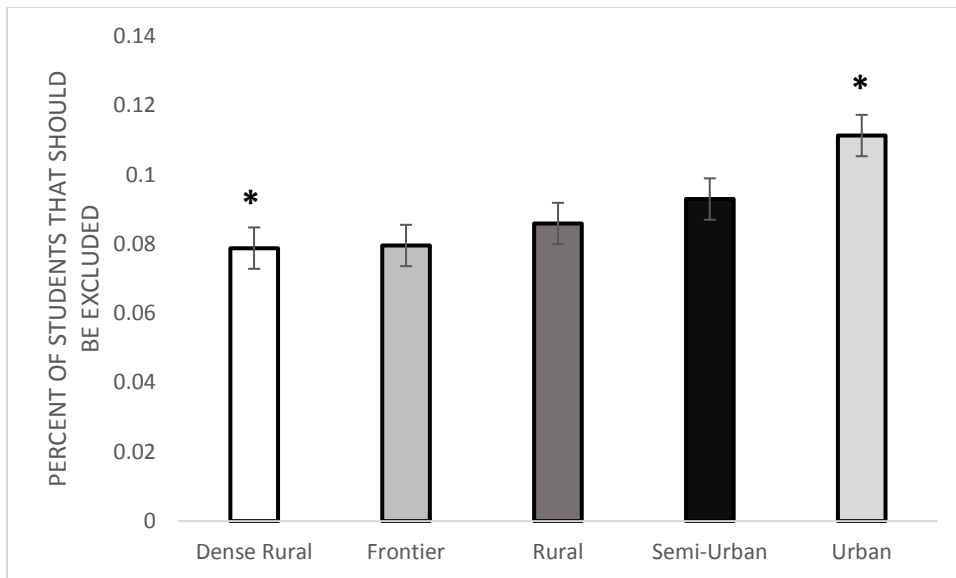


Figure 30: Percent of Kindergarten Students that should be excluded by population type and average as reported in the KDHE Kansas Kindergarten Immunization Assessment 2014-2017. Significance calculated changes between Dense Rural and Urban districts ($p \leq 0.05$) is indicated by *.

Schools participated in the survey about their policies for excluding students that are not up to date with their vaccinations or do not have exemptions (Fig. 31). In 2014, 71% reported having an exclusion policy, this was consistent with 2016 which saw a 0.7% increase of school reporting an exclusion policy. In 2016, 79.4% schools reported that they have an exclusion policy.

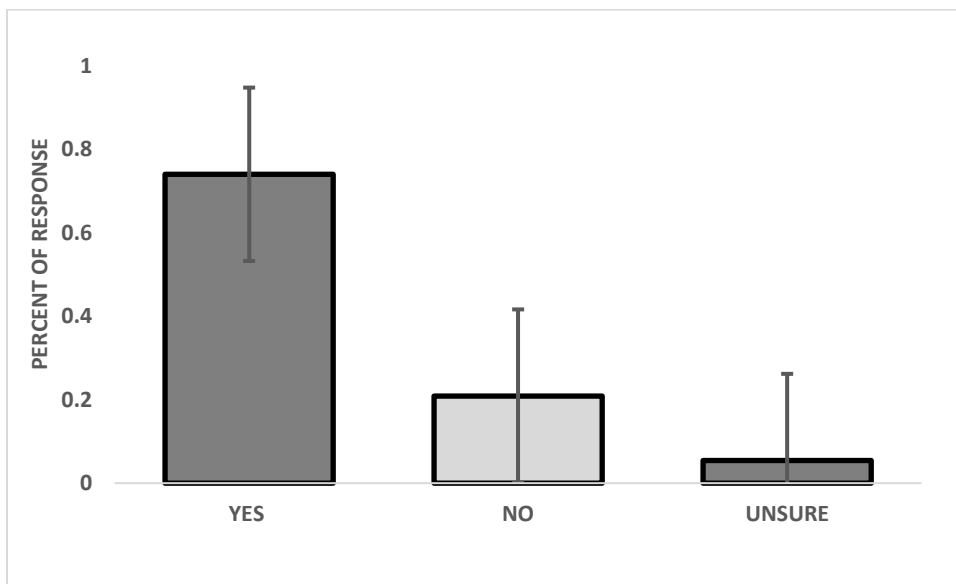


Figure 31: Percentage of Kansas schools reporting if they have an exclusion policy, from school years 2014-2017, by response. Data retrieved from KDHE Kansas Kindergarten Immunization Assessment. Significance of Yes vs No is indicated by *.

Discussion

We retrospectively surveyed the school nurses or representative of Kansas school districts for vaccination and exclusion policies. Using two distinct surveys, the Kansas Department of Health and Environments School Nurse Workforce Survey and the KDHE Kansas Kindergarten Immunization Assessment. The CDC recommendation for vaccination rates is 95%. We found that over 85% of kindergarten students have the required vaccinations. However, this is not sufficient coverage for herd immunity. Therefore, we made a number of recommendations.

In our survey, over 85% of students had the initial vaccination of those required for school entry to kindergarten individually (DTap, Polio, MMR, VAR, and HepB). Kindergarten exemption rates in the state averaged 1.74% over the three-year study with all schools having more religious exemptions compared to medical exemptions. On average there is a gap of 9.93% of kindergarten students who are not up to date on vaccinations and who do not have an exemption for medical or religious reasons. These trends are similar to surrounding states within the MidWest Plains Region reporting that around 80% of kindergarten children have the required vaccinations for school entry. Overall vaccination coverage in Colorado is about 79% with about 5% exemption over the same time period (CDPHE, 2015). Importantly, the average for students who do not have exemptions and who are not up to date is 20.2%. In contrast, reports 95% of students are up to date on immunizations (MDHSS, 2016) Exemption rates stayed similar during the same time period at about 2.2%. Further, the difference

in these two states could be due to types of exemptions available, Colorado may have a higher exemption rate because they allow personal belief exemptions where Missouri does not.

The exclusion rate is important because children that are not up to date or that are exempt are at risk for contracting a vaccine preventable disease, and spreading it to other non-vaccinated individuals, or those unable to received vaccinations due to age or illness. This Kindergarten Immunization Assessment showed that more than 70% of schools have an exclusion policy. Results from the School Nurse Workforce survey more than half of Kansas school districts have exclusion policies. Semi-Rural counties had the lowest rate of respondents indicating they have exclusion policies. Central Kansas counties reported more frequently they have exclusion policies, while Eastern counties reported it less frequently. There was not data from surrounding states to compare exclusion policies. School districts report 69% of the state is excluding students when they are not up to date on vaccinations and are not exempt for medical or religious reasons. Semi-Urban counties had the highest rates of exclusion, with Frontier counties having the lowest. SE school districts reported the highest rate of exclusion, SW counties had the lowest rate. Districts report being reluctant to exclude students because they feel being in school is more important than being vaccinated. Reasons for not excluding included fears of cost of vaccinations for uninsured students, lost medical records and finally that they do not have the manpower to enforce exclusion. Exclusion policies support schools by having a clearly laid out plan to follow, whether it be in the event of an outbreak or barring entrance to school for students not up to date. Few respondents indicated they planned on changing their

policies after receiving the model policy. Many did not know if there was a plan to change the policies, or that they were unsure if there was a plan to make changes. Only four districts indicated a plan to change their exclusion policies.

Medical and religious exemptions are important for students, many cannot receive vaccinations because they are ill or someone they live with is ill, some students are part of religious groups that do not advocate for immunizations. The number of school districts that allow for these exemptions was 57% allowing them. Private districts had a low response over public schools with only 37% reporting they allowed exemptions. Semi –Urban counties reported the highest rate of schools with exemption policy, while frontier had the lowest. NW counties have the highest rate of exemption policies with SE counties reporting the smallest rate.

When reporting grace periods answers varied greatly. Each district behaves differently, some even report schools within the district having different policies, most fall within the first semester. Frontier districts were most likely to report that they didn't have a grace period, and that students would have to be up to date prior to the start of school, the second most frequent response from Frontier districts was that students must be up to date by 90 days, or 12-week period. SE schools reported 90 days to 12 weeks was the grace period they used. Rather than using a grace period, districts would prefer to contact the parents via multiple communications and education. Most districts reported they had no plan to change their policies at this time. Policies are either in place and working or they do not intend on creating one. Of those that plan on changing their policy they are doing so because the policy was not being followed. Finally, respondents may modify existing policies to include more specific language, allowing a

student to stay in school if an appointment to get immunized is past the exclusion date and to include a specific date.

Immunizations have been touted by the CDC as the second-best thing to happen to public health (CDC & Ncird, 2013). Clean water is the first (CDC & Ncird, 2013). However, with the success of vaccinations there is a fading memory of the need of vaccinations. People who have no history of a disease do not fully realize the problems vaccine preventable diseases can cause. Fears of adverse effects from vaccines are at the forefront of many anti-vaccination campaigns. Parents are more able to assess the pros and cons of vaccinating their children due to the availability of information through other parents and the internet. Because of the intimate proximity of school children vaccinations are recommended at entry.

Schools face the same concerns as any mass gatherings, confined spaces and prolonged exposure. Students further spread disease to the local geographic area when they return home and participate in family and community events. Immunization recommendations are designed minimize the spread of vaccine preventable diseases.

Government mandates protect the greater good. Immunization recommendations change regularly as new research changes standards and as needs change. Policies should reflect legislative efforts and be reviewed and updated regularly. Changes to policies should be communicated so that each district interprets the meaning similarly for the best outcomes.

In trying to communicate the importance of vaccinations and updating exclusion policies there are many strategies that can be used. First, the media has the ability to disseminate information rapidly and repeatedly. The 24-hour news cycle that media

operates on could promote vaccination efforts and encourage the change of policies for schools. In the same way that celebrities endorsed Dr. Wakefield's research a celebrity who promotes vaccination could be very effective. Second, communities that engage in active conversations about policies are more likely to follow the policies. Parental input into developing vaccination policies, and school exclusion policies would benefit the school when trying to enforce policies. An educational component about vaccinations and policies would help parents see the need for such policies and allow them to ask questions. Finally, an educational outreach program designed with simple information about vaccinations and policies would encourage compliance. Many people do not know the rate of vaccinated children in their area, including this information might encourage more parents to vaccinate. This outreach program could also include events designed to inform, engage and vaccinate children.

Considerations to keep in mind when using any of these strategies include: not including fear tactics, addressing the topic at a personal level and to keep from being aggressive/argumentative. A simple mistake people use when trying to pass information on about vaccination is to try and scare parents. They may not understand the fear of a vaccine preventable disease but telling a parent the worst-case scenario for a disease can alienate parents. Parents try to do the best thing for their individual child. Addressing why a parent does not want to vaccinate their child(ren) can be communicated in a non-aggressive manner that looks at individual reasons why vaccination is beneficial. Using statements about herd immunity and benefits for the greater good tend to be ineffective. These statements are ineffective because the parental concern about vaccinations is also a concern about their individual child(ren)

and what the vaccine could do to their child(ren). Simple statements like 'MMR does not cause Autism' can be construed as aggressive and argumentative. Instead asking a parent "*why do you believe MMR causes Autism*" opens the same parent up to explain their fears and allows an open dialogue without discounting their feelings. In short, mutual respect and understanding are vital in increasing vaccination awareness and compliance.

Limitations to data

It is critical to point out that in both surveys, the data was self-reported at either the school-level in the KDHE Kansas Kindergarten Immunization Coverage Assessment or the district level for the School Nurse Survey. Aggregated data could not be confirmed prior to it being sent to the KDHE and does not include demographic information. Not all immunizations required for school entry match the recommended schedule which may result in under reporting of certain vaccinations (Hib3, HepA2, and PCV4). Districts with fewer schools may not be represented each year. School Nurse Workforce survey responses were calculated prior to the close of the survey before calls were made to complete unfinished surveys. The survey did not represent all districts or counties. Any questions regarding the IKC model policy would only impact representatives that were employed July 2016. Finally, data for both surveys only includes public and private schools, it does not include homeschools or special schools.

References

- A., B. J., & McKenna, K. Y. A. (2004). The internet and social life. *Annual Review of Psychology*, 55, 573.
- Alqahtani, A. S., Alfelali, M., Arbon, P., Booy, R., & Rashid, H. (2015). Burden of vaccine preventable diseases at large events. *Vaccine*, (33), 6652–6563.
<https://doi.org/10.1016/j.vaccine.2015.09.076>
- Antona, D., Lévy-Bruhl, D., Baudon, C., Freymuth, F., Lamy, M., Maine, C., ... du Chatelet, I. P. (2013). Measles elimination efforts and 2008-2011 outbreak, France. *Emerging Infectious Diseases*, 19(3), 357–364.
<https://doi.org/10.3201/eid1903.121360>
- Bauch, C. T., & Bhattacharyya, S. (2012). Evolutionary game theory and social learning can determine how vaccine scares unfold. *PLoS Computational Biology*.
<https://doi.org/10.1371/journal.pcbi.1002452>
- Bellaby, P. (2003). Communication and miscommunication of risk: understanding UK parents' attitudes to combined MMR vaccination. *BMJ*.
<https://doi.org/10.1136/bmj.327.7417.725>
- Betsch, C., Renkewitz, F., Betsch, T., & Ulshöfer, C. (2010). The influence of vaccine-critical websites on perceiving vaccination risks. *Journal of Health Psychology*, 15(3), 446–455. <https://doi.org/10.1177/1359105309353647>
- Birnbaum, M. S., Jacobs, E. T., Ralston-King, J., & Ernst, K. C. (2013). Correlates of high vaccination exemption rates among kindergartens. *Vaccine*, 31(5), 750–756.
<https://doi.org/10.1016/j.vaccine.2012.11.092>
- Blyth, C. C., Foo, H., van Hal, S. J., Hurt, A. C., Barr, I. G., McPhie, K., ... Dwyer, D. E.

- (2010). Influenza outbreaks during world youth day 2008 mass gathering. *Emerging Infectious Diseases*, 16(5), 809–815. <https://doi.org/10.3201/eid1605.091136>
- Bonanni, P., & Santos, J. I. (2011). Vaccine evolution. *Perspectives in Vaccinology*. <https://doi.org/10.1016/j.pervac.2011.05.001>
- Bowes, J. (2016). Measles, misinformation, and risk: personal belief exemptions and the MMR vaccine. *Journal of Law and the Biosciences*, 3(3), 718–725. <https://doi.org/10.1093/jlb/lsw057>
- Bromberger, N. (2017). Vaccine-preventable diseases: Compensating victims and deterring non-vaccinators? *Alternative Law Journal*, 42(3), 211–215. <https://doi.org/10.1177/1037969X17730200>
- Butler, R., MacDonald, N. E., Eskola, J., Liang, X., Chaudhuri, M., Dube, E., ... Schuster, M. (2015). Diagnosing the determinants of vaccine hesitancy in specific subgroups: The Guide to Tailoring Immunization Programmes (TIP). *Vaccine*. <https://doi.org/10.1016/j.vaccine.2015.04.038>
- Buttenheim, A. M., Cherng, S. T., & Asch, D. A. (2013). Provider dismissal policies and clustering of vaccine-hesitant families: An agent-based modeling approach. *Human Vaccines and Immunotherapeutics*, 9(8), 1819–1824. <https://doi.org/10.4161/hv.25635>
- Cataldi, J. R., Dempsey, A. F., & O'Leary, S. T. (2016). Measles, the media, and MMR: Impact of the 2014–15 measles outbreak. *Vaccine*. <https://doi.org/10.1016/j.vaccine.2016.10.048>
- CDC. (2017a). Vaccine Safety. Retrieved from <https://www.cdc.gov/vaccinesafety/concerns/thimerosal/environmental->

exposures.html

CDC. (2017b). Vaccines & Immunizations. Retrieved from

<https://www.cdc.gov/vaccines/vac-gen/immunity-types.htm>

CDC, & Ncird. (2013). Understanding How Vaccines Work. Retrieved from

<https://www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf>

CDPHE. (2015). Immunization reports and data. Retrieved from

<https://www.colorado.gov/pacific/cdphe/immunization-rates-reports-and-data>

Centers for Disease Control and Prevention (U.S.). (2015). General recommendations on

Immunization. *Epidemiology and Prevention of Vaccine-Preventable Diseases*, 9–32.

Constable, C., Blank, N. R., & Caplan, A. L. (2014). Rising rates of vaccine exemptions:

Problems with current policy and more promising remedies. *Vaccine*.

<https://doi.org/10.1016/j.vaccine.2014.01.085>

Diekema, D. S. (2014). Personal Belief Exemptions From School Vaccination

Requirements. *Annual Review of Public Health*, 35(1), 275–292.

<https://doi.org/10.1146/annurev-publhealth-032013-182452>

Dubé, E., Gagnon, D., Nickels, E., Jeram, S., & Schuster, M. (2014). Mapping vaccine

hesitancy-Country-specific characteristics of a global phenomenon. *Vaccine*,

32(49), 6649–6654. <https://doi.org/10.1016/j.vaccine.2014.09.039>

Dubov, A., & Phung, C. (2015). Nudges or mandates? The ethics of mandatory flu

vaccination. *Vaccine*. <https://doi.org/10.1016/j.vaccine.2015.03.048>

Dunn, A. G., Leask, J., Zhou, X., Mandl, K. D., & Coiera, E. (2015). Associations

- between exposure to and expression of negative opinions about human papillomavirus vaccines on social media: An observational study. *Journal of Medical Internet Research*, 17(6), e144. <https://doi.org/10.2196/jmir.4343>
- Faasse, K., Chatman, C. J., & Martin, L. R. (2016). A comparison of language use in pro- and anti-vaccination comments in response to a high profile Facebook post. *Vaccine*, 34(47), 5808–5814. <https://doi.org/10.1016/j.vaccine.2016.09.029>
- Feikin, D. R. (2000). Individual and Community Risks of Measles and Pertussis Associated With Personal Exemptions to Immunization. *JAMA*, 284(24), 3145. <https://doi.org/10.1001/jama.284.24.3145>
- Hinman, A. R., Orenstein, W. A., Williamson, D. E., & Darrington, D. (n.d.). Childhood Immunization: Laws That Work.
- Jacobson, R. M., St. Sauver, J. L., & Finney Rutten, L. J. (2015). Vaccine hesitancy. *Mayo Clinic Proceedings*, 90(11), 1562–1568. <https://doi.org/10.1016/j.mayocp.2015.09.006>
- Kata, A. (2012). Anti-vaccine activists, Web 2.0, and the postmodern paradigm - An overview of tactics and tropes used online by the anti-vaccination movement. *Vaccine*, 30(25), 3778–3789. <https://doi.org/10.1016/j.vaccine.2011.11.112>
- Kempe, A., Daley, M. F., McCauley, M. M., Crane, L. A., Suh, C. A., Kennedy, A. M., ... Dickinson, L. M. (2011). Prevalence of parental concerns about childhood vaccines: The experience of primary care physicians. *American Journal of Preventive Medicine*. <https://doi.org/10.1016/j.amepre.2010.12.025>
- Lai, Y. K., Nadeau, J., McNutt, L. A., & Shaw, J. (2014). Variation in exemptions to school immunization requirements among New York State private and public

- schools. *Vaccine*. <https://doi.org/10.1016/j.vaccine.2014.10.077>
- Lantos, J. D., Jackson, M. A., & Harrison, C. J. (2012). Why We Should Eliminate Personal Belief Exemptions to Vaccine Mandates. *Journal of Health Politics, Policy and Law*, 37(1), 131–140. <https://doi.org/10.1215/03616878-1496038>
- May, T., & Silverman, R. D. (2003). “Clustering of exemptions” as a collective action threat to herd immunity. *Vaccine*, 21(11–12), 1048–1051. [https://doi.org/10.1016/S0264-410X\(02\)00627-8](https://doi.org/10.1016/S0264-410X(02)00627-8)
- McClure, C. C., Cataldi, J. R., & O’Leary, S. T. (2017). Vaccine Hesitancy: Where We Are and Where We Are Going. *Clinical Therapeutics*. <https://doi.org/10.1016/j.clinthera.2017.07.003>
- MDHSS. (2016). Missouri School Immunization Rates. Retrieved from <http://health.mo.gov/living/wellness/immunizations/pdf/KindergartenData4.25.16.pdf>
- National Centre for Immunisation Research and Surveillance. (2017). Significant events in immunisation policy and practice* in Australia Year Event.
- NDHHS. (2018). Immunization Program. Retrieved from <http://dhhs.ne.gov/publichealth/Immunization/Pages/Home.aspx>
- OSHD. (2018). OSHD Annual Report. Retrieved from https://www.ok.gov/health/Data_and_Statistics/
- Owen, J. C., Punt, J. (Haverford C., & Stranford, S. (Mount H. C. (2009). *Kuby Immunology*.
- Peretti-Watel, P., Larson, H. J., Ward, J. K., Schulz, W. S., & Verger, P. (2015). Vaccine hesitancy: Clarifying a theoretical framework for an ambiguous notion. *PLoS Currents*, 7(OUTBREAKS).

- <https://doi.org/10.1371/currents.outbreaks.6844c80ff9f5b273f34c91f71b7fc289>
- Phadke, V. K., Bednarczyk, R. A., Salmon, D. A., & Omer, S. B. (2016). Association between vaccine refusal and vaccine-preventable diseases in the United States A review of measles and pertussis. *JAMA - Journal of the American Medical Association*, 315(11), 1149–1158. <https://doi.org/10.1001/jama.2016.1353>
- Pineda, D., & Myers, M. G. (2011). Finding Reliable Information About Vaccines. *Pediatrics*, 127(Supplement), S134–S137. <https://doi.org/10.1542/peds.2010-1722T>
- Plotkin, S. (2014). History of vaccination. *Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.1400472111>
- Poland, G. A., & Jacobson, R. M. (2012). The clinician's guide to the anti-vaccinationists' galaxy. *Human Immunology*, 73(8), 859–866. <https://doi.org/10.1016/j.humimm.2012.03.014>
- Rials, M. (2016). By the Pricking of My Thumbs, State Restriction This Way Comes: Immunizing Vaccination Laws from Constitutional Review. *Louisiana Law Review*, 77, 1–41.
- Richards, J. L., Wagenaar, B. H., Van Otterloo, J., Gondalia, R., Atwell, J. E., Kleinbaum, D. G., ... Omer, S. B. (2013). Nonmedical exemptions to immunization requirements in California: A 16-year longitudinal analysis of trends and associated community factors. *Vaccine*. <https://doi.org/10.1016/j.vaccine.2013.04.053>
- Robertson, C. (2013). The Science of Vaccination: Establishing Safety and Efficacy. *South Dakota Journal of Medicine*.
- Safi, H., Wheeler, J. G., Reeve, G. R., Ochoa, E., Romero, J. R., Hopkins, R., ...

- Jacobs, R. F. (2012). Vaccine policy and Arkansas childhood immunization exemptions: A multi-year review. *American Journal of Preventive Medicine*.
<https://doi.org/10.1016/j.amepre.2012.02.022>
- Salmon, D. A., MacIntyre, C. R., & Omer, S. B. (2015). Making mandatory vaccination truly compulsory: well intentioned but ill conceived. *The Lancet Infectious Diseases*.
[https://doi.org/10.1016/S1473-3099\(15\)00156-5](https://doi.org/10.1016/S1473-3099(15)00156-5)
- Salmon, D. A., Omer, S. B., Moulton, L. H., Stokley, S., deHart, M. P., Lett, S., ... Halsey, N. A. (2005). Exemptions to School Immunization Requirements: The Role of School-Level Requirements, Policies, and Procedures. *American Journal of Public Health, 95*(3), 436–440. <https://doi.org/10.2105/AJPH.2004.046201>
- Salmon, D. A., Sapsin, J. W., Teret, S., Jacobs, R. F., Thompson, J. W., Ryan, K., & Halsey, N. A. (2005). Public Health and the Politics of School Immunization Requirements. *American Journal of Public Health, 95*(5), 778–783.
<https://doi.org/10.2105/AJPH.2004.046193>
- Salmon, D. A., Teret, S. P., MacIntyre, C. R., Salisbury, D., Burgess, M. A., & Halsey, N. A. (2006). Compulsory vaccination and conscientious or philosophical exemptions: past, present, and future. *The Lancet, 367*(9508), 436–442.
[https://doi.org/10.1016/S0140-6736\(06\)68144-0](https://doi.org/10.1016/S0140-6736(06)68144-0)
- Shafi, S., Booy, R., Haworth, E., Rashid, H., & Memish, Z. A. (2008). Hajj: Health lessons for mass gatherings. *Journal of Infection and Public Health, 1*(1), 27–32.
<https://doi.org/10.1016/j.jiph.2008.08.008>
- Shaw, J., Tserenpuntsag, B., McNutt, L. A., & Halsey, N. (2014). United states private schools have higher rates of exemptions to school immunization requirements than

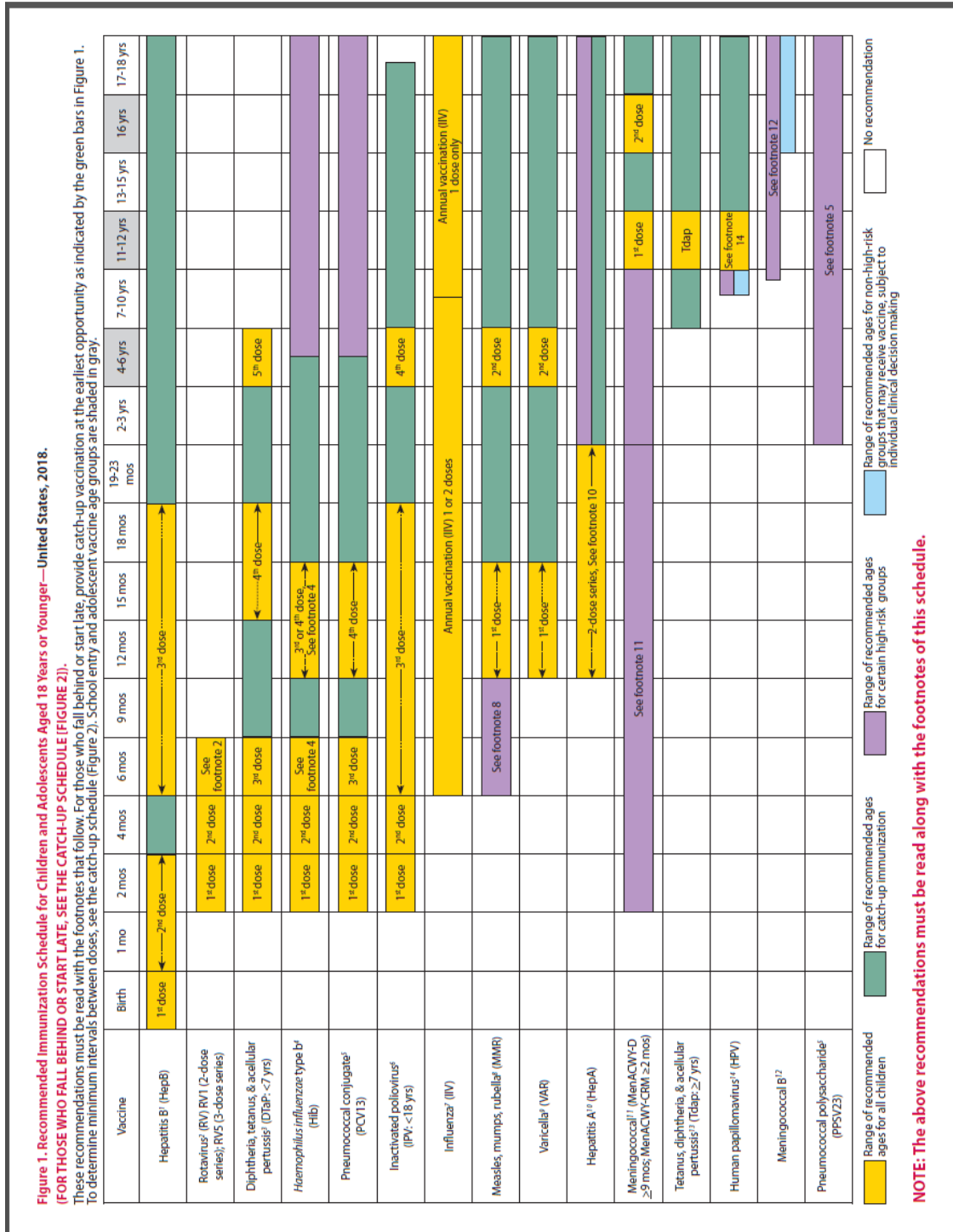
- public schools. *Journal of Pediatrics*. <https://doi.org/10.1016/j.jpeds.2014.03.039>
- Stein, R. A. (2017). Editorial The golden age of anti-vaccine conspiracies. *Germes*, 7(December), 168–170.
- Stern, A. M., & Markel, H. (2005). The history of vaccines and immunization: Familiar patterns, new challenges - If we could match the enormous scientific strides of the twentieth century with the political and economic investments of the nineteenth, the world's citizens might be much heal. *Health Affairs*.
<https://doi.org/10.1377/hlthaff.24.3.611>
- Sun, X., Keim, M., He, Y., Mahany, M., & Yuan, Z. (2013). Reducing the risk of public health emergencies for the world's largest mass gathering. *Disaster Health*, 1(1), 21–29. <https://doi.org/10.4161/dish.22537>
- Tafuri, S., Gallone, M. S., Cappelli, M. G., Martinelli, D., Prato, R., & Germinario, C. (2014). Addressing the anti-vaccination movement and the role of HCWs. *Vaccine*, 32(38), 4860–4865. <https://doi.org/10.1016/j.vaccine.2013.11.006>
- Tangherlini, T. R., Roychowdhury, V., Glenn, B., Crespi, C. M., Bandari, R., Wadia, A., ... Bastani, R. (2016). “Mommy Blogs” and the Vaccination Exemption Narrative: Results From A Machine-Learning Approach for Story Aggregation on Parenting Social Media Sites. *JMIR Public Health and Surveillance*, 2(2), e166.
<https://doi.org/10.2196/publichealth.6586>
- Thomas, E. G. (1980). The old poor law and medicine. *Medical History*, 24(1), 1–19.
<https://doi.org/10.1017/S0025727300039764>
- Thompson, J. W., Tyson, S., Card-Higginson, P., Jacobs, R. F., Wheeler, J. G., Simpson, P., ... Salmon, D. A. (2007). Impact of Addition of Philosophical

- Exemptions on Childhood Immunization Rates. *American Journal of Preventive Medicine*, 32(3), 194–201. <https://doi.org/10.1016/j.amepre.2006.10.014>
- Tolsma, E. C. (2015). Protecting our herd how a national mandatory vaccination policy protects public health by ensuring herd immunity. *The Journal of Gender, Race & Justice*, 18, 313–339.
- Venkatraman, A., Garg, N., & Kumar, N. (2015). Greater freedom of speech on Web 2.0 correlates with dominance of views linking vaccines to autism. *Vaccine*, 33(12), 1422–1425. <https://doi.org/10.1016/j.vaccine.2015.01.078>
- Ventola, C. L. (2016). Immunization in the United States: Recommendations, Barriers, and Measures to Improve Compliance Part 1: Childhood Vaccinations. *Pharmacy and Therapeutics*, 41(7), 426–436. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4927017/>
- Verger, P., Fressard, L., Collange, F., Gautier, A., Jestin, C., Launay, O., ... Peretti-Watel, P. (2015). Vaccine Hesitancy Among General Practitioners and Its Determinants During Controversies: A National Cross-sectional Survey in France. *EBioMedicine*, 891–897. <https://doi.org/10.1016/j.ebiom.2015.06.018>
- Vortmann, M., Balsari, S., Holman, S. R., & Greenough, P. G. (2015). Water, Sanitation, and Hygiene at the World's Largest Mass Gathering. *Current Infectious Disease Reports*, 17(2). <https://doi.org/10.1007/s11908-015-0461-1>
- Wang, E., Baras, Y., & Buttenheim, A. M. (2015). “Everybody just wants to do what’s best for their child”: Understanding how pro-vaccine parents can support a culture of vaccine hesitancy. *Vaccine*, 33(48), 6703–6709. <https://doi.org/10.1016/j.vaccine.2015.10.090>

- Wang, E., Clymer, J., Davis-Hayes, C., & Bittenheim, A. (2014). Nonmedical exemptions from school immunization requirements: A systematic review. *American Journal of Public Health, 104*(11), e62–e84.
<https://doi.org/10.2105/AJPH.2014.302190>
- Wicker, S., & Maltezou, H. C. (2014). Vaccine-preventable diseases in Europe: Where do we stand? *Expert Review of Vaccines, 13*(8), 979–987.
<https://doi.org/10.1586/14760584.2014.933077>
- Williamson, S. (1984). Anti-vaccination leagues. *Archives of Disease in Childhood, 59*(12), 1195–1196. <https://doi.org/10.1136/adc.59.12.1195>
- Wolfe, R. M. (2002). Anti-vaccinationists past and present. *BMJ, 325*(7361), 430–432.
<https://doi.org/10.1136/bmj.325.7361.430>
- Wolfe, R. M., & Sharp, L. K. (2005). Vaccination or immunization? The impact of search terms on the internet. *Journal of Health Communication, 10*(6), 537–551.
<https://doi.org/10.1080/10810730500228847>
- Yarwood, J., Noakes, K., Kennedy, D., Campbell, H., & Salisbury, D. (2005). Tracking mothers attitudes to childhood immunisation 1991–2001. *Vaccine, 23*(48), 5670–5687. <https://doi.org/10.1016/j.vaccine.2004.11.081>

Appendix

Appendix 1: CDC Immunization schedule



Appendix 2: Colorado's School Entry Requirements



Code of Colorado Regulations
Secretary of State
State of Colorado

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Disease Control and Environmental Epidemiology Division

THE INFANT IMMUNIZATION PROGRAM AND IMMUNIZATION OF STUDENTS ATTENDING SCHOOL

6 CCR 1009-2

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

Adopted by the Board of Health on June 21, 2017

I. Definitions

- A. Advisory Committee on Immunization Practices (ACIP) - a group of medical and public health experts that develops recommendations on how to use vaccines to control diseases in the United States. ACIP was established under Section 222 of the Public Health Service Act (42 U.S.C. § 217a).
- B. Child - any student less than 18 years of age.
- C. College or university student - any student who is enrolled for one or more classes at a college or university and who is physically present at the institution. This includes students who are auditing classes but does not include persons taking classes online or by correspondence only.
- D. Delegated physician assistant – a licensed physician assistant authorized under Section 12-36-106(5), C.R.S., to execute Certificates of Immunization, medical exemptions and/or supervise a public health or school nurse as authorized by part 9 of article 4 of title 25, C.R.S.
- E. Dose - a measured quantity of an immunizing agent; quantity and frequency of administration determined by recognized health authorities and the manufacturer of each agent.
- F. Emancipated student - any student who has reached age 18; a lawfully married child of any age; a child 15 years of age or older who is managing his/her own financial affairs and who is living separate and apart from his/her parent.
- G. Immunization tracking system - a comprehensive immunization tracking system established by the Department of Public Health and Environment pursuant to Section 25-4-2403(2), C.R.S., that enables the gathering of epidemiological information from the sources delineated in section 25-4-2403(2), C.R.S. and the investigation and control of communicable diseases. Individuals, parents and legal guardians may provide information to the immunization tracking system; however, pursuant to section 25-4-2403(7), C.R.S., they have the option to exclude their or their student's immunization information from the immunization tracking system at any time.
- H. Indigent child - any child whose parent cannot afford to have the child immunized or if emancipated, who cannot himself/herself afford immunization and who has not been exempted.
- I. Infant - any child up to twenty-four months of age or any child eligible for vaccination and enrolled under the Colorado Medical Assistance Act, Articles 4, 5, and 6 of Title 25.5, C.R.S.

- J. In-process student - a student may be considered in-process if:
1. Within fourteen days after receiving direct personal notification that the certificate of immunization is not up-to-date according to the requirements of the state board of health, the parent or emancipated student submits documentation that the next required immunization has been given and a signed written plan for obtaining the remaining required immunizations. The scheduling of immunizations in the written plan shall follow medically recommended minimum intervals consistent with the ACIP. If the student does not fulfill the plan, the student shall be suspended or expelled from school for noncompliance as noted in Section 25-4-907, C.R.S. If the next dose is not medically indicated within fourteen days, then the medically approved minimum intervals would apply.
 2. With regard to college or university students as defined in Section I (C), the student must present to the appropriate official of the school either (I) a signed written authorization requesting local health officials to administer required immunizations or (II) a plan for receipt of the required immunization or the next required immunization in a series within either 30 days or the medically approved minimum interval. If this does not occur, the college or university student will not be allowed to enroll, remain enrolled, or audit for the current term or session. Such written authorizations and plans must be signed by one parent or guardian or the emancipated student or the student eighteen years of age or older.
- K. Parent - the person or persons with parental or decision-making responsibilities for a child.
- L. Practitioner - a duly licensed physician, advanced practice nurse, or other person who is permitted and otherwise qualified to administer vaccines under the laws of this state.
- M. School - all child care facilities licensed by the Colorado Department of Human Services including: child care centers, school-age child care center, preschools, day camps, resident camps, day treatment centers, family child care homes, foster care homes, and head start programs; public, private, or parochial kindergarten, elementary or secondary schools through grade twelve, or a college or university. Schools do not include a public services short-term child care facility as defined in Section 26-6-102(30), C.R.S., a guest child care facility as defined in Section 26-6-102(16), C.R.S., a ski school as defined in Section 26-6-103.5 (6), C.R.S., or college or university classes which are: offered off-campus; offered to nontraditional adult students as defined by the governing board of the institution; offered at colleges or universities which do not have residence hall facilities, or; online only.
- N. School health authority - an individual working for or on behalf of the child care facility or school who is knowledgeable about childcare/school immunizations.
- O. School official - the school's chief executive officer or any person designated by him/her as his/her representative.
- P. Student - any person enrolled in a Colorado school as defined in Section I (M), except:
1. a child who enrolls and attends a licensed child care center, as defined in section 26-6-102(5), C.R.S., which is located at a ski area, for up to fifteen days or less in a fifteen-consecutive-day period, no more than twice in a calendar year, with each fifteen-consecutive-day period separated by at least sixty days, and
 2. college and university students as defined in Section I (C).

- Q. Titer – a titer is a laboratory test that measures the presence and amount of antibodies in blood. Antibody titers can be used to show that a person is immune to some diseases.

II. Minimum Immunization Requirements

- A. To attend school, a student must have an age appropriate Certificate of Immunization. Meeting the initial immunization requirements does not exempt a student from meeting subsequent age requirements. This certificate must demonstrate immunization against the following diseases:

1. Hepatitis B
2. Pertussis
3. Tetanus
4. Diphtheria
5. Haemophilus Influenzae Type B (HIB)
6. Pneumococcal disease
7. Polio
8. Measles
9. Mumps
10. Rubella
11. Varicella

- B. The minimum number of doses required by age of the student is set forth in the 2017 ACIP Birth – 18 Years Recommended Immunization Schedule or the 2017 ACIP Catch-Up Immunization Schedule.

1. The 2017 ACIP Birth-18 Years Recommended Immunization Schedule (Schedule) is incorporated by reference for only those vaccines required to prevent the diseases listed in Section II (A). Other immunizations included in the ACIP recommendations are not required. This schedule is posted on the Centers for Disease Control and Prevention website at: <https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf> or on the Colorado Department of Public Health and Environment website at: [\[www.coloradoimmunizations.com\]](http://www.coloradoimmunizations.com), and is available for public inspection during regular business hours at the Colorado Department of Public Health and Environment, 4300 Cherry Creek Drive South, Denver, Colorado 80246. Copies of the recommended schedules are available from the Colorado Department of Public Health and Environment for a reasonable charge that comports with the Department's record request practices. This rule does not include any later amendments or editions of the ACIP Schedule.

2. In addition, the 2017 ACIP Catch-Up Immunization Schedule is incorporated by reference for those children not fully immunized and only for those vaccines required to prevent the diseases listed in Section III II (A). Other immunizations included in the ACIP recommendations are not required. This recommended schedule is posted on the Centers for Disease Control and Prevention website at: <https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf> or on the Colorado Department of Public Health and Environment website at [www.coloradoimmunizations.com], and is available for public inspection during regular business hours at the Colorado Department of Public Health and Environment, 4300 Cherry Creek Drive South, Denver, Colorado 80246. Copies of the recommended schedules are available from the Colorado Department of Public Health and Environment for a reasonable charge that comports with the department's record request practices. This rule does not include any later amendments or editions of the ACIP Catch-Up Schedule.
- C. Students between the ages of 4 through 6 years are required to receive their final doses of Diphtheria, Tetanus, and Pertussis (DTaP), Inactivated Polio Vaccine (IPV), Measles, Mumps, and Rubella (MMR) and Varicella prior to kindergarten entry.
- D. Students are required to have administered Tetanus, Diphtheria, Pertussis (Tdap) prior to entry into 6th grade. One dose of Tdap is a requirement for 6th through 12th grades.
- E. Positive titers are an acceptable alternative to the following vaccines: DTaP, Hepatitis B, Varicella and MMR. For DTaP substitution, both the diphtheria and tetanus titers must be positive. For MMR substitution, titers for measles, mumps, and rubella must be positive. A titer is not an acceptable replacement for *Haemophilus Influenzae* type b, Pneumococcal, IPV, or Tdap vaccines.

III. Exemptions from Immunization

It is the responsibility of the parent(s) to have his or her student immunized unless the student is exempted. A student may be exempted from receiving the required immunizations in the following manner:

- A. Medical exemption - By submitting a medical exemption form with the statement of medical exemption signed by an advanced practice nurse, a delegated physician assistant, or physician licensed to practice medicine or osteopathic medicine in any state or territory of the United States indicating that the physical condition of the student is such that immunizations would endanger his/her life or health or is medically contraindicated due to other medical conditions. This form is to be submitted once, and must be maintained on file at each new school the student attends.
- B. Religious exemption - By submitting a nonmedical exemption form signed by the parent(s) or the emancipated student indicating that the parent(s) or emancipated student is an adherent to a religious belief whose teachings are opposed to immunizations.

Beginning July 1, 2016,

1. Prior to kindergarten entry, a nonmedical exemption form must be submitted at each interval in the ACIP Birth-18 years immunization schedule at which immunizations are due. The ACIP immunization schedule is incorporated in Section II (B). This documentation is required only for those vaccines required to prevent the diseases listed in Section II (A). Exemptions will expire at the time next immunizations are due according to the ACIP birth-18 years immunization schedule or when the student is enrolled to attend kindergarten.

2. From kindergarten through twelfth grade, a nonmedical exemption form must be submitted once per school year. Exemptions will expire annually on June 30th, the last official day of the school year.
- C. Personal belief exemption - By submitting a nonmedical exemption form signed by the parent(s) or the emancipated student indicating that the parent(s) or emancipated student has a personal belief that is opposed to immunizations.

Beginning July 1, 2016,

1. Prior to kindergarten entry, a nonmedical exemption form must be submitted at each interval in the ACIP Birth-18 years immunization schedule at which immunizations are due. The ACIP immunization schedule is incorporated in Section II (B). This documentation is required only for those vaccines required to prevent the diseases listed in Section II (A). Exemptions will expire at the time next immunizations are due according to the ACIP birth-18 years immunization schedule or when the student is enrolled to attend kindergarten.
 2. From kindergarten through twelfth grade, a nonmedical exemption form must be submitted once per school year. Exemptions will expire annually on June 30th, the last official day of the school year.
- D. In the event of an outbreak of disease against which immunization is required, no exemption or exception from immunization shall be recognized and exempted persons may be subject to exclusion from school and quarantine.
- E. All information distributed to the parent(s) by school districts regarding immunization shall inform them of their rights under Section III (A-D).

IV. Examination and audit of official school immunization records

The Department of Public Health and Environment's representative shall have the right to audit and verify records to determine compliance with the law. Discrepancies found through audits shall be corrected by school officials, and any student not in full compliance shall be suspended or expelled from school according to the following rules:

- A. If the parent(s) or emancipated student was informed of the deficiencies in the student's official school immunization records pursuant to Section I (J) (1) of the rules, the student shall be suspended or expelled pursuant to Section 25-4-907, C.R.S.
- B. If the parent(s) or emancipated student was not informed by a direct personal notification of the immunizations required and alternatives for compliance with the law, the school shall notify the parent(s) or emancipated student within 7 calendar days of the finding and the student shall: a) provide proof of immunization within fourteen days, b) continue as an in-process student, c) verify that the student is exempt, or d) the student shall be suspended or expelled pursuant to Section 25-4-907, C.R.S.

V. Denial of attendance

- A. A student who is: not in-process, not appropriately vaccinated for his/her age, or not exempt shall be denied attendance in accordance with the law.

- B. If the student is attending a school which is not subject to the School Attendance Law, Section 22-33-101 et seq., C.R.S., the school officials shall take appropriate action to deny attendance to the student in accordance with that school's procedures or contract with the student. No indigent child shall be excluded, suspended, or expelled from school unless the immunizations have been available and readily accessible to the indigent child at public expense.

VI. Official school immunization records

A. Official school immunization records shall include:

1. An official Certificate of Immunization or an Alternate Certificate of Immunization approved by the Department of Public Health and Environment, which shall include one of the following forms of documentation with the dates and types of immunizations administered to a student:
 - a. A paper or electronic document that includes information transferred from the records of a licensed physician, registered nurse, a delegated physician assistant, or public health official, or
 - b. An electronic file or hard copy of an electronic file provided to the school directly from the immunization tracking system established pursuant to Section 25-4-2403, C.R.S., or from a software program approved by the Department of Public Health and Environment, or
2. An official medical exemption form with the date and vaccines exempted from, or
3. A nonmedical exemption form with the date, type of exemption taken and the vaccines exempted from.

- B. Any immunization record (original or copy) provided by a physician licensed to practice medicine or osteopathic medicine in any state or territory of the United States, registered nurse, a delegated physician assistant, or public health official may be accepted by the school official as proof of immunization. The information is to be verified by the school official and transferred to an official Certificate of Immunization.

- C. Schools shall have on file an official school immunization record for every student enrolled. The official school immunization record will be kept apart from other school records. When a student withdraws, transfers, or is promoted to a new school, the school official shall return the Certificate of Immunization to the parent(s) or emancipated student upon request or transfer it with the student's school records to the new school. Upon a college or university student's request, the Certificate of Immunization shall be forwarded as specified by the student.

VII. Reporting of Statistical Information

- A. On December 1, 2016, and each year thereafter, any child care center, preschool or head start program that is licensed by the Colorado Department of Human Services to provide care to ten or more children and are not exempt from reporting pursuant to Paragraph B of this Section, and; public, private, or parochial schools with kindergarten, elementary or secondary schools through grade twelve, shall send aggregate immunization and exemption data, by antigen, to the Department of Public Health and Environment.

Required data shall include:

1. Total number of students and total number of kindergarten students enrolled in the school;

2. Total number of students and total number of kindergarten students who are up-to-date with immunizations as required in Section II;
 3. Total number of students and total number of kindergarten students who have a medical exemption for all immunizations as required in Section II;
 4. Total number of students and total number of kindergarten students who have a medical exemption for one or more but not all immunizations as required in Section II;
 5. Total number of students and total number of kindergarten students who have a religious exemption for all immunizations as required in Section II;
 6. Total number of students and total number of kindergarten students who have a religious exemption for one or more but not all immunizations as required in Section II;
 7. Total number of students and total number of kindergarten students who have a personal belief exemption for all immunizations as required in Section II;
 8. Total number of students and total number of kindergarten students who have a personal belief exemption for one or more but not all immunizations as required in Section II;
 9. Total number of in-process students and total number of in-process kindergarten students;
 10. Total number of students and total number of kindergarten students not up-to-date for immunizations as required in part III Section II, with no exemption on file, and not in-process; and
 11. Total number of students and total number of kindergarten students with no immunization records.
- B. Schools not required to send aggregate immunization and exemption data to the Department of Public Health and Environment include: school-age child care centers, family child care homes, drop-in centers, day treatment centers, foster care homes, day camps, and resident camps.
- VIII. Notification of noncompliance**
- A. Section 25-4-907, C.R.S. requires that if a student is suspended or expelled from school for failure to comply with the immunization law, the school official shall notify the state or local department of health or public health nurse who shall then contact the parent(s) or emancipated student in an effort to secure compliance so that the student may be re-enrolled in school.
- B. Upon receipt of an immunization referral from the school, the public health department or public health nurse shall contact the parent(s) of the referred student or the emancipated student himself/herself to offer immunization and to secure compliance with the school immunization law in order that the student may provide a completed Certificate of Immunization to the school and in the case of an expelled or suspended student, be re-enrolled in school.

IX. Requirements for college and university students, colleges and universities.

The provisions below apply only to colleges or universities, or students enrolled in a college or university.

A. Exemptions from immunization

A college or university student may be exempted from receiving required immunizations in the following manner:

1. Medical exemption - By submitting a medical exemption form with the statement of medical exemption signed by an advanced practice nurse, a delegated physician assistant, or physician licensed to practice medicine or osteopathic medicine in any state or territory of the United States indicating that the physical condition of the college or university student is such that immunizations would endanger his/her life or health or is medically contraindicated due to other medical conditions. This form is to be submitted once, and must be maintained on file at each new school the college or university student attends.
2. Religious exemption - By submitting a nonmedical exemption form signed by the college or university student 18 years of age or older, the parent if the college or university student is under 18 years of age, or the emancipated college or university student indicating that the college or university student, parent or emancipated college or university student is adherent to a religious belief whose teachings are opposed to immunizations. As of July 1, 2016, beginning with college or university entry, a nonmedical exemption form must be submitted at enrollment.
3. Personal belief exemption - By submitting a nonmedical exemption form signed by the college or university student 18 years of age or older, the parent if the college or university student is under 18 years of age, or the emancipated college or university student indicating that the college or university student, parent or emancipated college or university student has a personal belief that is opposed to immunizations. As of July 1, 2016, beginning with college or university entry, a nonmedical exemption form must be submitted at enrollment.
4. In the event of an outbreak of disease against which immunization is required, no exemption or exception from immunization shall be recognized and exempted persons may be subject to exclusion from school and quarantine.

B. Minimum immunization requirements

1. Two valid doses of the Measles, Mumps and Rubella vaccine are required for all college or university students, unless the college or university student was born before 1957, or the college or university student can provide laboratory confirmation of disease as a criterion for acceptable evidence of immunity for Measles, Rubella, and Mumps.

2. Pursuant to Section 25-4-901, C.R.S. et. seq., and Section 23-5-128 (3), C.R.S., each college and university shall provide information concerning Meningococcal disease and Meningococcal vaccine to each new college or university student residing in student housing, or if the college or university student is under 18 years, to the college or university student's parent or guardian. College and university students residing in student housing who have not received a Meningococcal vaccine within the last five years shall review the information concerning Meningococcal disease and Meningococcal vaccine. If the college or university student does not obtain a vaccine, a signature must be obtained from the college or university student or if the college or university student is under 18 years, the college or university student's parent or guardian indicating that the information was reviewed and the college or university student or college or university student's parent or guardian has declined the vaccine.

C. Examination and audit of official school immunization records

The Department of Public Health and Environment's representative shall have the right to audit and verify records to determine compliance with the law. Discrepancies found through audits shall be corrected by school officials, and any college or university student not in full compliance shall be denied attendance from school according to the rules in Section IX (D).

D. Denial of attendance

1. A college or university student who is: not in-process, not appropriately vaccinated for his/her age, or not exempt shall be denied attendance in accordance with the law.
2. A school official shall deny attendance from school, pursuant to the provisions established by the school, any college or university student not in-process, not appropriately immunized for his/her age, or not exempt per Section 25-4-903, C.R.S. no college or university student shall be denied attendance for failure to comply unless there has been a direct personal notification of noncompliance by the appropriate school authority to the college or university student's parent or guardian, the emancipated college or university student or the college or university student 18 years of age or older.

E. Official school immunization records

1. Official school immunization records shall include one of the following:
 - A. An official Certificate of Immunization or an Alternate Certificate of Immunization approved by the Department of Public Health and Environment, which shall include one of the following forms of documentation with the dates and types of immunizations administered to a college or university student:
 1. A paper or electronic document that includes information transferred from the records of a licensed physician, registered nurse, a delegated physician assistant, or public health official, or
 2. An electronic file or hard copy of an electronic file provided to the school directly from the immunization tracking system established pursuant to Section 25-4-2403 C.R.S. or from a software program approved by the Department of Public Health and Environment, or
 - B. An official medical exemption form with the date and vaccines exempted from, or
 - C. A nonmedical exemption form with the date, type of exemption taken and the vaccines exempted from.

2. Any immunization record (original or copy) provided by a physician licensed to practice medicine or osteopathic medicine in any state or territory of the United States, registered nurse, a delegated physician assistant, or public health official may be accepted by the school official as proof of immunization.
 3. Schools shall have on file an official school immunization record for every college or university student enrolled.
- F. Reporting of statistical information –on December 1, 2016, and each year thereafter, any college or university that constitutes a school as defined by Section I (M) shall send aggregate immunization and exemption data, by antigen, to the Department of Public Health and Environment:
- Required data shall include:
1. Total number of college or university students enrolled in the school;
 2. Total number of college or university students who are up-to-date with immunizations as required in this Section (IX);
 3. Total number of college or university students who have a medical exemption for the MMR vaccine;
 4. Total number of college or university students who have a religious exemption for the MMR vaccine;
 5. Total number of college or university students who have a personal belief exemption for the MMR vaccine;
 6. Total number of in-process college or university students;
 7. Total number of college or university students who have a signed waiver for the Meningococcal vaccine;
 8. Total number of college or university students not up-to-date for the MMR vaccine, with no exemption on file, no Meningococcal vaccine waiver on file, and not in-process; and
 9. Total number of college or university students with no immunization records.
- X. **Contract Requirements for Providers, Hospitals, and Health Care Clinics to be an Agent of the Department of Public Health and Environment for the Purposes of the Immunization Program**
- A. To be an agent of the Department of Public Health and Environment for the purposes of administering immunizations to infants, children, and students, a provider, hospital, or health care clinic must agree to provide each patient receiving a vaccine, or the parent or legal guardian if such patient is an unemancipated minor, a copy of the currently approved vaccine information statement.
 - B. The Department of Public Health and Environment shall make such requirements as are necessary to assure the confidentiality and security of information in an immunization tracking system operated pursuant to Section 25-4-1705(5)(e)(I)(H), C.R.S and Section 25-4-1705(7), C.R.S.

XI. Fee for the Administration, Reporting, and Tracking of Vaccine

This rule applies to immunizations purchased by CDPHE that are recommended by the Advisory Committee on Immunization Practices of the U.S. Department of Health and Human Services and provided to Colorado practitioners.

- A. Practitioners may charge up to the Centers for Medicare and Medicaid services maximum regional fee for the administration of vaccine. These fees apply to all vaccines purchased by CDPHE, including but not limited to the Infant Immunization Program, and Immunization of Children Attending School.
- B. A vaccine recipient may not be denied vaccine provided by CDPHE because of inability to pay the administration fee.
- C. If a practitioner's vaccine administration costs are less than the Centers for Medicare and Medicaid Services maximum regional fee for the administration of vaccine, then they may only charge up to that lesser amount.

XII. On-line educational module

As necessary to comply with section 25-4-903 (2.5), C.R.S., the Department of Public Health and Environment shall provide immunization information to the public. The immunization information and contents of this module shall include, but are not limited to:

- A. Exemption rates in Colorado that are available to the public through the Department,
- B. Evidence-based research,
- C. Resources and information from credible scientific and public health organizations, and
- D. Peer-reviewed studies.

Editor's Notes

History

Section I, Table 1, Table 2 eff. 03/01/2008.

Section I, Table 1 eff. 03/02/2009.

Sections I-XI, Table 1 eff. 12/30/2010.

Sections I.L., II. A., Table 1 eff. 07/01/2012.

Section XI emer. rule eff. 01/16/2013.

Section XI, Table 1, Table 2 eff. 04/14/2013.

Sections I-IV, VI, IX, XI eff. 10/15/2014. Table 1, Table 2 repealed eff. 10/15/2014.

Sections I-VII, XII eff. 07/01/2015.

Sections I-IX eff. 10/15/2015. Sections III.C-D repealed eff. 10/15/2015.

Sections II, III, VII, IX eff. 07/15/2016.

Sections I.C-IV.A, VI.A-VII.A.11, IX.A.1, IX.E-F eff. 07/30/2017.

Annendix 3: Nebraska School Entry Requirement

EFFECTIVE
2/5/13

NEBRASKA DEPARTMENT OF
HEALTH AND HUMAN SERVICES

173 NAC 3

TITLE 173 CONTROL OF COMMUNICABLE DISEASE

CHAPTER 3 SCHOOL HEALTH, COMMUNICABLE DISEASE CONTROL, AND
IMMUNIZATION STANDARDS

3-001 SCOPE AND AUTHORITY: These regulations are intended to implement Neb. Rev. Stat. §§ 79-217 to 79-223.

3-002 DEFINITIONS: For purposes of these regulations:

Booster dose means a dose of vaccine given after the initial series to enhance waning immunity to specific disease(s).

Child or children means any student or students enrolled in a public or private elementary or secondary school system in Nebraska.

Department means the Department of Health and Human Services.

Local health department means a county, district, or city-county health department approved by the Department of Health and Human Services as a local full-time public health service.

Reportable communicable disease means those diseases which are required by law to be reported pursuant to 173 NAC 1.

3-003 SYMPTOMS OF COMMUNICABLE DISEASE; EXCLUSION FROM SCHOOL: Children showing any signs or symptoms of a contagious or infectious disease are required by law to be sent to their homes immediately, or as soon as safe and proper conveyance can be found.

Teachers are encouraged to observe each child carefully for signs of illness each time the child returns to school. This is particularly important when epidemic diseases are known to be present in the community.

The presence of one or more of the following signs or symptoms should make the teacher suspect a communicable disease:

Fever, flushed face, headache, aches in muscles or joints, unexplained tiredness or listlessness, loss of appetite, stomach ache, nausea or vomiting, diarrhea, convulsions, sore throat, nasal congestion or discharge, unexplained skin eruption, sore or inflamed eyes.

3-004 REPORTING

3-004.01 Suspected Contagious or Infectious Disease: When a child is sent home because of a suspected contagious or infectious disease, the law requires the proper school authority, school board, or board of education to be notified without delay.

3-004.02 Suspected Reportable Disease: When a school nurse or an individual acting in the capacity of a school nurse identifies a case or suspected case of a reportable disease, s/he must report that case to the local public health department or the DHHS Division of Public Health as provided in 173 NAC 1-007.04.

3-005 DURATION OF EXCLUSION PERIOD: Children excluded for a confirmed communicable disease should not be allowed to return to school until the minimum isolation period has elapsed, and all signs or symptoms of acute illness have disappeared. The period of exclusion should extend throughout the period when acute signs of illness are present, or until the student is fever-free for 24 hours without the use of fever-reducing medication.

Minimum isolation periods are shown in the table on Attachment 1, Contagious and Infectious Disease/Condition Chart, which is attached to 173 NAC 3 and incorporated by this reference. School boards and boards of education may observe these periods, or adopt and enforce their own exclusion regulations which may not be shorter or less restrictive than those contained in 173 NAC 3.

3-006 EXCLUSION OF HEALTH CONTACTS: With a few exceptions (which are shown in the table on Attachment 1) there are no restrictions placed upon the health contacts of communicable diseases by these regulations; consequently, they may attend school unless the local health department, board of health, school board or board of education has adopted rules and regulations to the contrary. If officials consider exclusion of health contacts necessary, it is suggested that whenever possible this be confined to the latter portion of the incubation period and enforced only for those children who are not known to be immune.

3-007 (RESERVED)

3-008 IMMUNIZATION STANDARDS: Each student must be protected by immunization against the following diseases, unless otherwise exempted from this requirement under the provisions of 173 NAC 3-010:

Measles	Diphtheria	Invasive pneumococcal disease
Mumps	Tetanus	
Rubella	Pertussis	
Polio	Haemophilus Influenzae type b (Hib)	
Hepatitis B	Varicella	

3-008.01 For the purposes of complying with the requirement of immunization against the diseases listed above:

3-008.01A Students 2-5 years of age enrolled in a school-based program not licensed as a child care provider are considered to be immunized if they have received:

- 3 doses of hepatitis B vaccine;
- 4 doses of DTaP, DTP, or DT vaccine;
- 3 doses of polio vaccine;
- 1 dose of MMR vaccine given no earlier than 4 days before the first birthday;
- 3 doses of hib vaccine or 1 dose of hib vaccine given at or after 15 months of age;
- 1 dose of varicella vaccine; and
- 4 doses of pneumococcal vaccine or 1 dose of pneumococcal vaccine given at or after 15 months.

3-008.01B Students enrolling for the first time (kindergarten or 1st grade, depending on the school district's entering grade), enrolling in 7th grade, and all transfer students from outside the state regardless of the grade they are entering are considered immunized if they have received:

- 3 doses DTaP, DTP, DT, or Td vaccine with at least 1 dose given no earlier than 4 days before 4 years of age;
- 3 doses of polio vaccine;
- 2 doses of MMR vaccine with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days;
- 3 doses of pediatric hepatitis B vaccine, or, if the alternate hepatitis B vaccination schedule is used, 2 doses of a licensed adult hepatitis B vaccine specified for adolescents 11-15 years of age; and
- 2 doses of varicella vaccine with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.

Students enrolling in 7th grade must provide evidence of having 1 booster dose of a tetanus, diphtheria, and pertussis (Tdap) vaccine, given on or after 7 years of age.

3-008.01C All other students are considered immunized if they have received:

- 3 doses of DTaP, DTP, DT, or Td vaccine, with at least 1 dose given no earlier than 4 days before 4 years of age;
- 3 doses of polio vaccine;
- 2 doses of MMR vaccine with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days;
- 3 doses of hepatitis B vaccine; and
- 2 doses of varicella vaccine with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.

3-009 REQUIRED EVIDENCE OF IMMUNIZATION

3-009.01 For purposes of compliance with the immunization requirement, the board of education or school board or other governing authority, must require the presentation of

an immunization history which includes the name of the vaccine and the month, day, and year of administration.

3-009.02 Laboratory evidence of circulating antibodies for measles, mumps, or rubella constitutes evidence of immunity against those diseases provided the following information is supplied: name of laboratory, date of test, name of test, test result, signature of laboratory technician performing the test or of the laboratory director, and date of signature. For purposes of compliance with this rule, clinical history of measles, mumps, or rubella without laboratory or epidemiologic confirmation does not constitute evidence of immunity.

3-009.03 Epidemiologic confirmation of a diagnosis means that the clinical history of measles, mumps, or rubella is corroborated by association with laboratory proven case(s) and that such epidemiologic case(s) have been reported to and counted by the Department.

3-009.04 A documented history of varicella disease from a parent or health care provider with the year of infection constitutes evidence of immunity to varicella. The documentation must include one of the following:

1. Signature of the parent or legal guardian and the date (year) of the child's varicella illness, or
2. Signature of a health care provider and the date (year) of the child's varicella illness, or
3. Laboratory evidence of a child's varicella immunity, or
4. A clinical diagnosis of shingles.

3-010 MEDICAL AND RELIGIOUS EXEMPTION; PROVISIONAL ENROLLMENT: Each student must be protected against the diseases listed using the standards described in 173 NAC 3-008 and submit evidence of immunization as described in 173 NAC 3-009. Any student who does not comply with these requirements must not be permitted to enroll in school, except as provided in 173 NAC 3-010.01 through 3-010.03.

3-010.01 Immunization is not required for a student's enrollment in any school in this state if he or she submits to the admitting official either of the following:

3-010.01A A statement signed by a physician, physician assistant, or nurse practitioner stating that, in the health care provider's opinion, the specified immunization(s) required would be injurious to the health and well-being of the student or any member of the student's family or household; or

3-010.01B A notarized affidavit signed by the student or, if he or she is a minor, by a legally authorized representative of the student, stating that the immunization conflicts with the tenets and practice of a recognized religious denomination of which the student is an adherent or member or that immunization conflicts with the personally and sincerely followed religious beliefs of the student.

3-010.02 A student may be provisionally enrolled in a school in Nebraska if he or she has begun the immunizations against the specified diseases prior to enrollment and continues the necessary immunizations as rapidly as is medically feasible. For purposes of complying with these requirements:

3-010.02A A student is considered to have begun immunizations against polio, diphtheria, tetanus, pertussis, hepatitis B, measles, mumps, and rubella and varicella if he or she has had at least one dose of DTaP/DTP/DT/Td, one dose of hepatitis B, one dose of either trivalent OPV or one dose of IPV, either one dose of the combined measles, mumps, and rubella vaccine or one dose of each vaccine for measles, mumps, and rubella, and one dose of varicella vaccine.

3-010.02B Continuation of necessary immunizations as rapidly as is medically feasible must be documented by a written statement from the student's immunization provider which shows the scheduled dates to complete the required immunization series. Failure to receive the necessary immunizations as rapidly as is medically feasible will result in exclusion of the student from attending school until either documentation of immunization or a medical statement or religious affidavit is provided to the school. The time interval for the completion of the required immunization series must not exceed nine months.

3-010.03 A student may also be provisionally enrolled in a school in Nebraska if he or she is the child or legal ward of an officer or enlisted person, or the child or legal ward of the spouse of such officer or enlisted person on active duty in any branch of the military services of the United States, and said student is enrolling in a Nebraska school following residence in another state or in a foreign country.

3-010.03A As a condition for the provisional enrollment of a student under this Section, a parent or adult legal guardian of the student must provide the school with a signed written statement certifying that the student has completed the course of immunizations required by 173 NAC 3-008.

3-010.03B The provisional enrollment of a student qualified for such enrollment under 173 NAC 3-010.03 must not continue beyond 60 days from the date of such enrollment. At such time, the school must be provided, with regard to said student, written evidence of compliance with 173 NAC 3-008. The student must not be permitted to continue in school after such date until evidence of compliance is provided.

3-011 TIME OF COMPLIANCE: Each student must present documentation as outlined in 173 NAC 3-009 and 3-010 prior to enrollment.

3-012 REPORTING REQUIREMENTS: A report to the Department summarizing immunization status is required by November 15 of each year from the board of education or school board of each school district, or other governing authority of the school. The report must include the following information regarding those entering school for the first time (kindergarten or 1st grade), those entering the 7th grade, and all transfer students from outside the state (excluding the entering and 7th grades):

3-012.01 For children in the entering grade (kindergarten or 1st grade depending on the school district's entering grade):

1. The total number of students enrolled.
2. The total number of students with an exemption on file or who are in the process of completing immunizations.
3. Diphtheria, tetanus, and pertussis (DTP/DTaP/DT/Td):
 - a. The number of students with 3 or more doses of DTP/DTaP/DT/Td, with at least one dose given at or after 4 years of age.
 - b. The number of students with medical exemptions on file for diphtheria, tetanus, and pertussis.
 - c. The number of students with religious exemptions on file for diphtheria, tetanus, and pertussis.
 - d. The number of students provisionally enrolled.
4. Polio (IPV/OPV):
 - a. The number of students with 3 or more doses of polio vaccine.
 - b. The number of students with medical exemptions on file for polio.
 - c. The number of students with religious exemptions on file for polio.
 - d. The number of students provisionally enrolled.
5. Measles, mumps, and rubella (MMR):
 - a. The number of students with 2 doses of MMR with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.
 - b. The number of students presenting laboratory evidence of circulating antibodies or epidemiologic confirmation of measles, mumps, and rubella.
 - c. The number of students with medical exemptions on file for MMR.
 - d. The number of students with religious exemptions on file for MMR.
 - e. The number of students provisionally enrolled.
6. Hepatitis B:
 - a. The number of students with 3 doses of pediatric hepatitis B, or, if the alternate hepatitis B vaccination schedule is used, the number of students with 2 doses of a licensed adult hepatitis B vaccine specified for adolescents 11-15 years of age.
 - b. The number of students with medical exemptions on file for hepatitis B.
 - c. The number of students with religious exemptions on file for hepatitis B.
 - d. The number of students provisionally enrolled.
7. Varicella:
 - a. The number of students with 2 doses of varicella vaccine with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.
 - b. The number of students with documented history of varicella disease on file.
 - c. The number of students with medical exemptions on file for varicella.
 - d. The number of students with religious exemptions on file for varicella.
 - e. The number of students provisionally enrolled.
 - f. The number of students with a documented clinical diagnosis of shingles.

3-012.02 For children entering 7th grade:

1. The total number of students enrolled.
2. The total number of students with an exemption on file or who are in the process of completing immunizations.
3. Measles, mumps, and rubella (MMR):
 - a. The number of students with 2 doses of MMR, with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.
 - b. The number of students presenting laboratory evidence of circulating antibodies or epidemiologic confirmation of measles, mumps, and rubella.
 - c. The number of students with medical exemptions on file for MMR.
 - d. The number of students with religious exemptions on file for MMR.
 - e. The number of students provisionally enrolled.
4. Hepatitis B:
 - a. The number of students with 3 doses of pediatric hepatitis B, or, if the alternate hepatitis B vaccination schedule is used, the number of students with 2 doses of a licensed adult hepatitis B vaccine specified for adolescents 11-15 years of age.
 - b. The number of students with medical exemptions on file for hepatitis B.
 - c. The number of students with religious exemptions on file for hepatitis B.
 - d. The number of students provisionally enrolled.
5. Varicella:
 - a. The number of students with 2 doses of varicella vaccine with the first dose given no earlier than 4 days before the first birthday and the two doses separated by at least 28 days.
 - b. The number of students with documented history of varicella disease on file.
 - c. The number of students with medical exemptions on file for varicella.
 - d. The number of students with religious exemptions on file for varicella.
 - e. The number of students provisionally enrolled.
 - f. The number of students with a documented clinical diagnosis of shingles.
6. Beginning July 2010, and thereafter, one booster dose containing tetanus, diphtheria and pertussis (Tdap):
 - a. The number of students with 1 dose of Tdap (tetanus, diphtheria and pertussis).
 - b. The number with a medical exemptions on file for Tdap.
 - c. The number of students with religious exemptions on file for Tdap.
 - d. The number of students provisionally enrolled.

3-012.03 For transfer students from outside the state:

1. The total number of students enrolled.
2. The total number of students with an exemption on file or who are in the process of completing immunizations.
3. Measles, mumps, and rubella (MMR):
 - a. The number of students with 2 doses of MMR, with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.
 - b. The number of students presenting laboratory evidence of circulating antibodies or epidemiologic confirmation of measles, mumps, and rubella.
 - c. The number of students with medical exemptions on file for MMR.
 - d. The number of students with religious exemptions on file for MMR.
 - e. The number of students provisionally enrolled.
4. Hepatitis B:
 - a. The number of students with 3 doses of pediatric hepatitis B, or, if the alternate hepatitis B vaccination schedule is used, the number of students with 2 doses of a licensed adult hepatitis B vaccine specified for adolescents 11-15 years of age.
 - b. The number of students with medical exemptions on file for hepatitis B.
 - c. The number of students with religious exemptions on file for hepatitis B.
 - d. The number of students provisionally enrolled.
5. Varicella:
 - a. The number of students with 2 doses of varicella vaccine with the first dose given no earlier than 4 days before the first birthday and the 2 doses separated by at least 28 days.
 - b. The number of students with documented history of varicella disease on file.
 - c. The number of students with medical exemptions on file for varicella.
 - d. The number of students with religious exemptions on file for varicella.
 - e. The number of students provisionally enrolled.
 - f. The number of students with a documented clinical diagnosis of shingles.

3-012.04 The abbreviated reporting requirements for entering 7th graders and transferring students do not exempt them from meeting the immunization standards outlined in 173 NAC 3-008.01B.

CONTAGIOUS AND INFECTIOUS DISEASES/CONDITIONS

DISEASE / CONDITION	INCUBATION PERIOD *	SYMPTOMS OF ILLNESS	INFECTION PERIOD	MINIMUM ISOLATION PERIODS AND CONTROL MEASURES
Chickenpox	2-3 weeks	Fever, skin eruption begins as red spots that become small blisters (vesicles) and then scab over.	For up to 5 days before eruption until all lesions are crusted.	Exclude until all lesions are crusted; avoid contact with susceptibles. No exclusion of contacts. Alert parents of immune-suppressed child(ren) of possible exposure.
Conjunctivitis (Pink Eye)	24-72 hours	Redness of white of eye, tearing, discharge of pus.	During active phase of illness characterized by tearing and discharge.	Exclude symptomatic cases. Urge medical care. May return when eye is normal in appearance or with documentation from physician that child is no longer infectious. No exclusion of contacts.
Coryza (Common Cold)	12-72 hours	Nasal discharge, soreness of throat.	One day before symptoms and usually continuing for about 5 days.	Exclusion unnecessary. No exclusion of contacts.
Diphtheria	2-5 days	Fever, sore throat, often gray membrane in nose or throat.	Usually 2 weeks or less. Seldom more than 4 weeks.	Exclude cases. Return with a documented physician approval. Exclude inadequately immunized close contacts as deemed appropriate by school officials following investigation by the local and/or Nebraska Department of Health and Human Services. <i>Report immediately by telephone</i> all cases to local and/or state health departments.

DISEASE / CONDITION	INCUBATION PERIOD *	SYMPTOMS OF ILLNESS	INFECTION PERIOD	MINIMUM ISOLATION PERIODS AND CONTROL MEASURES
Enterobiasis (Pinworm, Thread-worm, Seatworm)	Life cycle about 3-6 weeks	Irritation around anal region. Visible in stool.	As long as eggs are being laid; usually 2 weeks.	Exclude until treated as documented by physician. No exclusion of contacts. Careful handwashing essential.
Fifth Disease	Estimated at 6-14 days	Minimal symptoms with intense red "slapped cheek" Appearing rash; lace-like rash on body.	Unknown.	Exclude until fever and malaise are gone. May return with rash; no longer contagious once rash appears. No exclusion of contacts; however, alert any students or staff who are pregnant, have chronic hemolytic anemia or immunodeficiency to consult their physician.
Hand, Foot and Mouth	3-5 days	Fever, sore throat, elevated blisters occurring on hands, feet or in the mouth.	During acute illness, usually one week. Spread through direct contact with nose and throat discharge and aerosol droplets.	Exclude cases during acute phase and until fever-free for 24 hours without the use of fever-reducing medication.
Hepatitis A	15-50 days, average 28-30 days	Fever, nausea, loss of appetite, abdominal discomfort and jaundice.	Two weeks before jaundice until about 7 days after onset of jaundice.	Exclude for no less than 7 days after onset of jaundice. Return with documented physician approval. No exclusion of contacts. Immune globulin (IG) or hepatitis A vaccine prevents disease if given within two weeks of exposure. IG to family contacts only. Careful handwashing essential.

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ATTACHMENT 1

DISEASE / CONDITION	INCUBATION PERIOD *	SYMPTOMS OF ILLNESS	INFECTION PERIOD	MINIMUM ISOLATION PERIODS AND CONTROL MEASURES
Herpes Simplex (Type 1)	2-12 days	Onset as clear vesicle, later purulent. Following rupture, scabs and in 1-2 weeks, heals. Commonly about lips and in mouth.	For a few weeks after appearance of vesicle.	Exclusion unnecessary. No exclusion of contacts. Avoid contact with immunosuppressed or eczematous persons. Good personal hygiene, avoid sharing toilet articles.
Impetigo	4-10 days	Running, open sores with slight marginal redness.	As long as lesions draining and case hasn't been treated.	Exclude until brought under treatment and acute symptoms resolved. No exclusion of contacts. Good personal hygiene is essential. Avoid common use of toilet articles.
Influenza	24-72 hours	Fever and chills, often back or leg aches, sore throat, nasal discharge and cough; prostration.	A brief period before symptoms until about a week thereafter.	Exclude for duration of illness. No exclusion of contacts.
Measles (Rubeola)	10-14 days	Begins like a cold; fever, blotchy rash, red eyes, hacking frequent cough.	5 days before rash until 4 days after rash.	Exclude for duration of illness and for no less than 4 days after onset of rash. Exclude unimmunized students on same campus from date of diagnosis of first case until 14 days after rash onset of last known case or until measles immunization received or laboratory proof of immunity is presented or until history of previous measles infection is verified as per records or the Nebraska Department of Health and Human Services. <i>Report immediately by telephone</i> all cases to local and/or state health departments.

DISEASE / CONDITION	INCUBATION PERIOD *	SYMPTOMS OF ILLNESS	INFECTION PERIOD	MINIMUM ISOLATION PERIODS AND CONTROL MEASURES
Meningitis (bacterial)	3-4 days with a range of 2-10 days	Sudden onset of fever, headache, stiff neck, nausea, vomiting, sensitivity to light, and altered mental status	Infectious until 24 hours into antibiotic course	Local or state health authorities will determine appropriate follow-up and investigation on a case-by-case basis. Student should be excluded from school until antibiotic course has been initiated and symptoms have fully resolved, and may return with medical clearance.
Meningitis (viral)	3-7 days	Sudden onset of fever, headache, stiff neck, nausea, vomiting, sensitivity to light, sleepiness, altered mental status; rubella-like rash may be present.	Infectious until symptoms have fully resolved.	Active illness seldom exceeds 10 days. Student should be excluded from onset of symptoms until full resolution, and may return with medical clearance.
MRSA (staph bacterial infection)	Variable and indefinite.	Skin lesion; can take on different forms.	As long as purulent lesions drain or the carrier state persists.	Exclusion unnecessary unless directed by physician. Keep lesions covered at school. Good handwashing and sanitation practices; no sharing of personal items.
Mumps (Epidemic Parotitis)	2-3 weeks	20-40% of those infected do not appear ill or have swelling. 60-70% have swelling with pain above angle of lower jaw on one or both sides.	About 7 days before gland swelling until 9 days after onset of swelling or until swelling has subsided.	Exclude 5 days from onset of swelling in the neck. No exclusion of contacts. Inform parents of unimmunized students on campus of possible exposure and encourage immunization.
Pediculosis (Infestation with head or body lice)	Eggs of lice hatch in about a week; maturity in about 2-3 weeks	Itching; infestation of hair and/or clothing with insects and nits (lice eggs).	While lice remain alive and until eggs in hair and clothing have been destroyed. Direct and indirect contact with infested person	Nits are not a cause for school exclusion. Parents of students with live lice are to be notified and the child treated prior to return to school. Only persons with active infestation need be treated. Avoid head- to-head contact. No exclusion of contacts.

DISEASE / CONDITION	INCUBATION PERIOD *	SYMPTOMS OF ILLNESS	INFECTION PERIOD	MINIMUM ISOLATION PERIODS AND CONTROL MEASURES
			and/or clothing required.	
Pertussis (Whooping Cough)	7 days – usually within 10 days	Irritating cough – symptoms of common cold usually followed by typical whoop in cough in 2- 3 weeks.	About 7 days after exposure to 3 weeks after typical cough. When treated with erythromycin, 5-7 days after onset of therapy.	Exclude until physician approves return per written documentation. Exclude inadequately immunized close contacts as deemed appropriate by school officials following investigation by the local and/or state Department of Health and Human Services. Chemoprophylaxis may be considered for family and close contacts. <i>Report immediately by telephone</i> all cases to local and/or state health departments.
Poliomyelitis (Infantile Paralysis)	3-35 days; 7-14 days for paralytic cases	Fever, sore throat, malaise, headache, stiffness of neck or back, muscle soreness.	Not accurately known. Maybe as early as 36 hours after infection; most infectious during first few days after onset of symptoms.	Exclude until physician approves return. <i>Report immediately by telephone.</i>
Ringworm (Tinea Infections)	10-14 days	Scaly oval patches of baldness of scalp; brittle and falling hair, scaly oval lesions of skin.	As long as infectious lesions are present, especially when untreated.	No exclusion of contacts. Good sanitation practices and don't share toilet articles. If affected areas cannot be covered with clothing/dressing during school, exclude until treatment started.
Rubella (German Measles)	14-21 days	Low-grade fever, slight general malaise; scattered Measles-like rash; duration of approximately 3 days.	About one week before rash until 7 days after onset of rash.	Exclude for duration of illness and for no less than 4 days* after onset of rash. Exclude unimmunized students on same campus from date of diagnosis of first case until 23* days after rash onset of last known case or until rubella immunization received or laboratory proof of immunity is presented. <i>Report immediately by telephone</i> all cases to local and/or state health departments.

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NEBRASKA DEPARTMENT OF
HEALTH AND HUMAN SERVICES

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ATTACHMENT 1

DISEASE / CONDITION	INCUBATION PERIOD *	SYMPTOMS OF ILLNESS	INFECTION PERIOD	MINIMUM ISOLATION PERIODS AND CONTROL MEASURES
Scabies	Infection caused by almost invisible mite. Lesions symptomatic after 4-6 weeks.	Severe itching; lesions around loose fleshy tissue (e.g., finger webs, elbows, crotch, etc.)	Until mites and eggs destroyed.	Exclude until the day after treatment is started. No exclusion of contacts.
Shingles / Herpes Zoster	Latent form after primary infection with chickenpox.	Grouped small blisters (vesicles) often accompanied by pain localized to area	Physical contact with vesicles until they become dry.	Exclude children with shingles / zoster if the vesicles cannot be covered until after the vesicles have dried. Individuals with shingles /zoster should be instructed to wash their hands if they touch the potentially infectious vesicles.
Streptococcal Infection; (Scarlet Fever, Scarletina, Strep Throat)	1-3 days	Sore throat, fever, headache. Rough rash 12-48 hours later.	Until 24-48 hours after treatment begun.	Exclude until afebrile and under treatment for 24 hours. No exclusion of contacts. Early medical care important and usually requires 10 days of antibiotic treatment. Screening for asymptomatic cases not recommended.
Tuberculosis Pulmonary	Highly variable – depends on age, life style, immune status. Primary: 4-12 weeks. Latent: 1-2 years after infection. Life-long risk.	Weakness, cough, production of purulent sputum, loss of weight, fever. Urinary tract symptoms if this system involved.	Until sputum is free from tuberculosis bacteria. Generally after a few weeks of effective treatment.	Exclude. Physician treatment essential. May return with documented physician approval. No exclusion of contacts. Skin test contacts and chemoprophylaxis with INH if positive (in absence of disease). Exclusion of nonpulmonary tuberculosis unnecessary.

* Day of onset of specific symptom is counted as "day zero;" the *day after onset* is "day 1;" *second day* after onset is "day 2;" and etc.

NOTE: *Careful handwashing* is the most important thing that can be done to prevent the spread of most infectious diseases.

Questions about this chart may be directed to the DHHS Division of Public Health, Lifespan Health Services, Immunization Program (402-471-6423) or School Health Program (402-471-0160).

Annendix 4: Oklahoma School Entry Requirements



Rules of Department of Health and Senior Services

Division 20—Division of Community and Public Health Chapter 28—Immunization

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**Title 19—DEPARTMENT OF
HEALTH AND SENIOR SERVICES**
Division 20—Division of Community and
Public Health
Chapter 28—Immunization

**19 CSR 20-28.010 Immunization Require-
ments for School Children**

PURPOSE: This rule establishes minimum immunization requirements for all students in accordance with recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Interstate Compact on Educational Opportunity for Military Children.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.

(1) The superintendent of each public, private, parochial, or parish school shall make a summary report to the Department of Health and Senior Services no later than October 15 of each school year. This date is necessitated by the law which prohibits the enrollment and attendance of students who are in noncompliance. This report shall include aggregate immunization information by grade by vaccine antigen, number of students enrolled, number of students in compliance with state immunization requirements, number of students in progress, number of students with signed medical exemption, number of students with signed religious exemption, number of students noncompliant with immunization record, and number of students with no immunization record. Each school superintendent or designee shall submit a summary report for all schools under the administrator's jurisdiction. Separate reports for each school should not be submitted, although separate lists shall be maintained in each school for auditing purposes.

(A) Exclusion of students in noncompliance, section 167.181, RSMo. Students cannot attend school unless they are properly immunized and can provide satisfactory evidence of the immunization or unless they are exempted. The school administration shall

exercise its power of pupil suspension or expulsion under section 167.161, RSMo, and possible summary suspension under section 167.171, RSMo, until the violation is removed. Transfer students in noncompliance shall not be permitted to enroll or attend school. Students enrolled during the previous school year shall be denied attendance for the current school year if not in compliance. Under section 160.2000, RSMo, children of military families shall be given thirty (30) days from the date of enrollment to obtain any required immunization, or initial vaccination for a required series of immunizations. A student determined to be homeless by school officials may be enrolled in school for no more than thirty (30) days prior to providing satisfactory evidence of immunization. If the homeless student's immunization record is not obtained within the thirty (30) days and the student is still eligible for services under the homeless education program, the student shall begin the immunization series and demonstrate that satisfactory progress has been accomplished within ninety (90) days. If the homeless student is exempted from receiving immunizations, then after the initial thirty- (30-) day enrollment, the student shall provide documentation in accordance with the exemption requirements included herein. For the purpose of this subsection, a homeless student shall be defined as a student who lacks a fixed, regular, and adequate nighttime residence; or who has a primary nighttime residence in a supervised publicly or privately operated shelter or in an institution providing temporary residence or in a public or private place not designated for or ordinarily used as a regular sleeping accommodation for human beings.

(B) This rule is designed to govern any student, regardless of age, who is attending a public, private, parochial, or parish school. If the specific age or grade recommendations are not mentioned within this rule, the Missouri Department of Health and Senior Services should be consulted.

(C) It is unlawful for any student to attend school unless the student has been immunized according to this rule or unless a signed statement of medical or religious exemption is on file with the school administrator. In the event of an outbreak or suspected outbreak of a vaccine-preventable disease within a particular facility, the administrator of the facility shall follow the control measures instituted by the local health authority or the Department of Health and Senior Services pursuant to 19 CSR 20-20.040.

1. Medical exemption. A student shall be

exempted from the immunization requirements of this rule as provided in section 167.181, RSMo, upon signed certification by a licensed doctor of medicine (MD), doctor of osteopathy (DO), or his or her designee indicating that either the immunization would seriously endanger the student's health or life or the student has documentation of disease or laboratory evidence of immunity to the disease. The exemption shall be provided on an original Department of Health and Senior Services' form Imm.P.12 and shall be placed on file with the school immunization health record for each student with a medical exemption. The Imm.P.12 form is incorporated by reference in this rule as published June 2012 by the Department of Health and Senior Services and may be obtained by contacting a medical provider, local public health agency, or the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions. This need not be renewed annually.

2. Religious exemption. A student shall be exempted from the immunization requirements of this rule as provided in section 167.181, RSMo, if one (1) parent or guardian objects in writing to the school administrator that immunization of that student violates his/her religious beliefs. This exemption must be provided on an original Department of Health and Senior Services' form Imm.P.11A, and shall be signed by the parent or guardian and placed on file with the school immunization health record. The Imm.P.11A form is incorporated by reference in this rule as published April 2012 by the Department of Health and Senior Services and may be obtained by contacting a medical provider, local public health agency, or the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions. This need not be renewed annually.

3. Immunization in progress. Section 167.181, RSMo, provides that students may continue to attend school as long as they have started an immunization series and provide satisfactory evidence indicating progress is being accomplished. An original Department of Health and Senior Services' form Imm.P.14 shall be completed and placed on file with the school immunization health record of each student with immunizations in progress. The Imm.P.14 form is incorporated by reference in this rule as published June 2012 by the Department of Health and Senior Services and



may be obtained by contacting a medical provider, local public health agency, or the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions. Failure to meet the next scheduled appointment constitutes noncompliance with the school immunization law and exclusion shall be initiated immediately. Refer to subsection (1)(A) of this rule regarding exclusion of students in noncompliance.

(2) Review of immunization requirements for school entry shall be conducted annually by each school superintendent or designee. Age- or grade-appropriate vaccine requirements shall be according to the *Missouri School Immunization Requirements Vaccines Received 0-18 Years of Age*, published on April 14, 2014 or the *Centers for Disease Control and Prevention's Catch-up Immunization Schedule for Persons Aged 4 Months through 18 Years Who Start Late or Who Are More Than 1 Month Behind*, published January 2014. These schedules are incorporated by reference in this rule and are available on the Department of Health and Senior Services' website at <http://health.mo.gov/immunizations/schoolrequirements.php> or by contacting the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions. Revisions to school immunization requirements shall be required for school attendance one (1) full year after publication in the *Code of State Regulations*, beginning with the first day of school of that school year.

(3) The parent or guardian shall furnish the superintendent or designee satisfactory evidence of immunization or exemption from immunization.

(A) Satisfactory evidence of immunization means a statement, certificate, or record from a physician or his or her designee, other recognized health facility, immunization registry, school record, or child care record stating that the required immunizations have been given to the person and verifying the type of vaccine. This statement, certificate, or record shall provide documentation of the specific antigen and the month, day, and year of vaccine administration.

AUTHORITY: section 192.006, RSMo 2000, and sections 167.181 and 192.020, RSMo

Supp. 2013. This rule was previously filed as 13 CSR 50-10.010. Original rule filed April 24, 1974, effective May 4, 1974. Rescinded and readopted: Filed April 17, 1980, effective Aug. 11, 1980. Amended: Filed Feb. 1, 1983, effective May 12, 1983. Amended: Filed Oct. 3, 1986, effective Dec. 25, 1986. Amended: Filed July 1, 1987, effective Sept. 11, 1987. Amended: Filed Aug. 4, 1988, effective Oct. 13, 1988. Amended: Filed May 31, 1989, effective Aug. 24, 1989. Amended: Filed Nov. 2, 1990, effective March 14, 1991. Amended: Filed April 2, 1991, effective Aug. 30, 1991. Amended: Filed Nov. 4, 1992, effective Aug. 1, 1993. Emergency amendment filed July 12, 1993, effective Aug. 1, 1993, expired Sept. 9, 1993. Amended: Filed April 5, 1993, effective Sept. 9, 1993. Emergency amendment filed May 3, 1994, effective May 13, 1994, expired Sept. 9, 1994. Emergency amendment filed July 28, 1994, effective Aug. 6, 1994, expired Dec. 3, 1994. Amended: Filed April 18, 1994, effective Nov. 30, 1994. Amended: Filed May 3, 1994, effective Nov. 30, 1994. Emergency amendment filed Nov. 29, 1994, effective Dec. 8, 1994, expired April 6, 1995. Amended: Filed Aug. 15, 1994, effective Feb. 26, 1995. Amended: Filed Aug. 16, 1996, effective Jan. 30, 1997. Amended: Filed Jan. 14, 1999, effective July 30, 1999. Amended: Filed Sept. 16, 2002, effective Feb. 28, 2003. Amended: Filed Sept. 23, 2003, effective April 30, 2004. Amended: Filed Oct. 1, 2008, effective March 30, 2009. Amended: Filed Nov. 30, 2011, effective June 30, 2012. Amended: Filed March 30, 2015, effective Oct. 30, 2015.*

**Original authority: 167.181, RSMo 1963, amended 1972, 1973, 1992, 1993, 1996, 1996, 2001; 192.006, RSMo 1993, amended 1995; and 192.020, RSMo 1939, amended 1945, 1951, 2004.*

19 CSR 20-28.030 Distribution of Childhood Vaccines (Rescinded March 30, 2009)

AUTHORITY: section 192.020, RSMo 1986. Original rule filed Nov. 15, 1988, effective July 1, 1989. Emergency amendment filed June 19, 1989, effective July 1, 1989, expired Oct. 26, 1989. Amended: Filed July 18, 1989, effective Sept. 28, 1989. Rescinded: Filed Oct. 1, 2008, effective March 30, 2009.

19 CSR 20-28.040 Day Care Immunization Rule

PURPOSE: This rule establishes immunization requirements in accordance with recommendations of the Advisory Committee on

Immunization Practices (ACIP) for all children attending public, private, or parochial day care, preschool or nursery schools caring for ten or more children, and describes actions to be taken to ensure compliance with section 210.003, RSMo.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.

(1) As mandated by section 210.003, RSMo, the administrator of each public, private, or parochial day care center, preschool, or nursery school caring for ten (10) or more children shall have a record prepared showing the immunization status of every child enrolled in or attending a facility under the administrator's jurisdiction. Each administrator caring for or licensed for ten (10) or more children shall complete an annual summary report showing the immunization status of each child enrolled and submit to the Department of Health and Senior Services no later than January 15 of each year. The summary report shall be submitted electronically through the department's online system at <http://health.mo.gov/immunizations/daycare-requirements.php> or by completing and mailing the Imm.P-32 form to the Bureau of Immunization Assessment and Assurance, PO Box 570, Jefferson City, MO 65102-0570. The Imm.P-32 form is incorporated by reference in this rule as published October 2013 by the Department of Health and Senior Services and may be obtained by contacting the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions.

(2) No child shall enroll in or attend a public, private, or parochial day care center, preschool, or nursery school caring for ten (10) or more children unless the child has been adequately immunized according to this rule. Children attending elementary school who receive before or after school care, or both, shall meet the immunization requirements established in the School Immunization Rule,



19 CSR 20-28.010. Age-appropriate vaccine requirements will be according to the *Missouri Day Care Immunization Requirements Vaccines Received 0-18 Years of Age* or the *Center for Disease Control and Prevention's Catch-up Immunization Schedule for Persons Aged 4 Months through 18 Years Who Start Late or Who Are More Than 1 Month Behind*. These schedules are incorporated by reference in this rule as published February 2014 by the Department of Health and Senior Services and are available on the web at <http://health.mo.gov/immunizations/daycare-requirements.php> or by contacting the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions.

(3) Section 210.003, RSMo, provides that a child who has not completed all appropriate immunizations may enroll if—

(A) Satisfactory evidence is produced that the child has begun the process of immunization. The child may continue to attend as long as they have started an immunization series and provide satisfactory evidence indicating progress is being accomplished. The Department of Health and Senior Services' form Imm.P.14 shall be completed and placed on file with the child's immunization health record for each child with immunizations in progress. Failure to meet the next scheduled appointment constitutes noncompliance with the day care immunization law, and action shall be initiated immediately by the administrator to have the child excluded from the facility. The Imm.P.14 form is incorporated by reference in this rule as published June 2012 and may be obtained by contacting a medical provider, local public health agency, or the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions.

(B) The parent or guardian has signed and placed on file with the day care administrator a statement of exemption which may be either of the following:

1. A medical exemption, by which a child shall be exempted from the requirements of this rule upon signed certification by a licensed doctor of medicine (MD), doctor of osteopathy (DO), or his or her designee indicating that either the immunization would seriously endanger the child's health or life,

or the child has documentation of disease or laboratory evidence of immunity to the disease. The Department of Health and Senior Services' form Imm.P.12 shall be placed on file with the immunization record of each child with a medical exemption. The Imm.P.12 form is incorporated by reference in this rule as published June 2012 by the Department of Health and Senior Services and may be obtained by contacting a medical provider, local public health agency, or the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions. The medical exemption need not be renewed annually; or

2. A parent or guardian exemption, by which a child shall be exempted from the requirements of this rule if one (1) parent or guardian files a written objection to immunization with the day care administrator. The Department of Health and Senior Services' form Imm.P.11 shall be signed by the parent or guardian and placed on file with the immunization record of each child with a parental exemption. The parental exemption must be renewed annually. The Imm.P.11 form is incorporated by reference in this rule as published July 2010 by the Department of Health and Senior Services and may be obtained by contacting a medical provider, local public health agency, or the department's Bureau of Immunization Assessment and Assurance at PO Box 570, Jefferson City, MO 65102-0570, or by calling 800-219-3224. This rule does not incorporate any subsequent amendments or additions.

(4) The parent or guardian shall furnish the day care administrator satisfactory evidence of completion of the required immunizations, exemption from immunization, or progress toward completing all required immunizations. Satisfactory evidence of immunization means a statement, certificate, or record from a physician or his or her designee, other recognized health facility, or immunization registry stating that the required immunizations have been given to the person and verifying type of vaccine. This statement, certificate, or record shall provide documentation of the specific antigen and the month, day, and year of vaccine administration. However, if a child has had varicella (chickenpox) disease, a licensed healthcare provider (e.g., school or occupational clinic nurse, nurse practitioner, physician assistant, physician) may sign and place

on file with the day care administrator a written statement documenting previous varicella (chickenpox) disease. The statement may contain wording such as: "This is to verify that (name of child) had varicella (chickenpox) disease on or about (date) and does not need varicella vaccine."

AUTHORITY: sections 192.006 and 210.003, RSMo 2000.* *Emergency rule filed Aug. 1, 1995, effective Aug. 11, 1995, expired Dec. 8, 1995. Original rule filed April 17, 1995, effective Nov. 30, 1995. Emergency amendment filed June 14, 2000, effective June 24, 2000, expired Feb. 22, 2001. Amended: Filed June 14, 2000, effective Nov. 30, 2000. Amended: Filed Jan. 3, 2001, effective July 30, 2001. Amended: Filed Oct. 1, 2008, effective March 30, 2009. Amended: Filed Nov. 30, 2011, effective June 30, 2012. Amended: Filed March 30, 2015, effective Oct. 30, 2015.*

*Original authority: 192.006, RSMo 1993, amended 1995; 210.003, RSMo 1988.

19 CSR 20-28.060 Minimum Immunization Coverage to Be Provided by Individual and Group Health Insurance Policies

PURPOSE: This rule identifies the immunizations which individual and group health insurance policies, as enumerated in H.B. 904, must provide for children from birth to five years of age.

(1) This rule requires that all individual and group health insurance policies providing coverage on an expense-incurred basis, individual and group service or indemnity-type contracts issued by a health services corporation, individual and group service contracts issued by a health maintenance organization and all self-insured group arrangements to the extent not preempted by federal law and all managed health care delivery entities of any type or description shall provide coverage for immunizations for children, birth to five (5) years of age, for all immunizations listed in section (2) of this rule.

(2) All immunization within the latest Recommended Childhood Immunization Schedule—United States, approved by the Advisory Committee on Immunization Practices (ACIP), shall be required under this rule. As the schedule is updated, it will be available from and distributed by the Department of Health. The immunizations



required under this rule and manner and frequency of their administration shall conform to recognized standards of medical practice.

*AUTHORITY: section 376.1215, RSMo Supp. 1998. * Emergency rule filed Aug. 16, 1996, effective Aug. 29, 1996, expired Feb. 24, 1997. Original rule filed Aug. 16, 1996, effective Jan. 30, 1997. Amended: Filed May 14, 1999, effective Nov. 30, 1999.*

**Original authority: 376.215, RSMo 1996.*

Annendix 5: Oklahoma School Entry Requirements

IMMUNIZATION REQUIREMENTS FOR SCHOOL ATTENDANCE

In 1970 the Oklahoma legislature added immunization requirements to Oklahoma State Statute Title 70, known as the Oklahoma School Code (Title 70 Sections 1210.191-193). The Oklahoma School Code and the Oklahoma Public Health Code give the Oklahoma State Board of Health the responsibility for prescribing the immunizations required to attend school and the manner and frequency of their administration.

The law was amended in 1976 to extend requirements to all children attending Oklahoma schools and to clarify that school officials are responsible for enforcement of the law. The following is a summary of the law. The complete text can be found in Title 70 of the Oklahoma Statutes, Sections 1210.191-193, which are reproduced in Appendix A beginning on page 27.

A Summary of the Law

Requirements

No minor child shall be admitted to any public, private, or parochial school operating in Oklahoma unless the parent or guardian can present to the appropriate school authorities certification from a licensed physician or public health authority that such child has received or is in the process of receiving the immunizations required for school entry, or is likely to be immune as a result of having had the disease. This means parents or guardians must present an immunization record for each child listing the vaccines the child has received.

Responsibility

The State Board of Health will prescribe the immunizations required and the manner and frequency of their administration. The requirements must conform to recognized medical practices in the state. The Oklahoma State Department of Health shall supervise and secure the enforcement of the required immunizations. The State Department of Education and the governing boards of the school districts of this state shall render reasonable assistance to the Oklahoma State Department of Health.

Changes in Requirements

The State Board of Health may change the list of required immunizations. All changes must be approved in hearings conducted by the State Board of Health. These hearings are open to the public, with time and place predetermined and public notice given. Any changes in the list of required immunizations must be submitted to the legislature at the next regular session. Changes made by the State Board of Health remain in force unless the legislature passes a resolution of disapproval. The state legislature can also change the list of required immunizations by amending the statute. Therefore, the original statute does not list all of the requirements which are listed in the regulations.

Exemptions

The parent or guardian of any child may request an exemption from any or all immunizations for medical, religious, or personal reasons. In such cases, a written statement from the parent, guardian, or physician must be on file with the school. Exemption forms are provided to parents by the school. Forms may be requested from the Oklahoma State Department of Health Immunization Service by calling (405) 271-4073.

Vaccine Administration and Inability to Pay

A licensed physician, someone under his or her direction, or a public health department may administer immunizations. If the parents or guardians are unable to pay for the immunizations required by law, the Oklahoma State Department of Health shall provide, without charge, the immunizations required.

Addition of Interstate Compact on Educational Opportunity for Military Children

The Department of Defense, in collaboration with the National Center for Interstate Compacts and the Council of State Governments developed an interstate compact to address the educational transition issues of children of military families. Oklahoma officially joined the Compact in June, 2008, when the Compact was added to the Oklahoma School Code (Title 70).

The purpose of the Compact is to ensure that children of military families are afforded the same opportunities for educational success as other children and are not penalized or delayed in achieving their educational goals by differences in state rules.

Regarding immunizations, the compact specifies that a child transferring to a member state who needs additional immunizations is allowed to enroll and begin attending school. He or she is then given 30 days to obtain the needed immunizations. If a series of immunizations is required, it must be started within 30 days of enrollment.

Resource:

American Association of School Administrators: Fact Sheet on the Interstate Compact on Educational Opportunity for Military Children
<http://www.aasa.org/content.aspx?id=9460>

Specific Immunization Requirements

The Oklahoma State Board of Health determines which vaccines are required, the number of doses required for each vaccine, the minimum age for the first dose of each vaccine, and the minimum time between doses of multi-dose vaccines. The minimum ages and intervals must be observed for the vaccine doses to be effective and to be counted as valid doses for school attendance. These requirements, the Oklahoma State Department of Health Immunization Regulations, Title 10, Chapter 535, are reproduced in Appendix B beginning on page 29 of this booklet. The State Board of Health currently

requires children attending school in Oklahoma to be immunized against the following diseases:

- Diphtheria
- Tetanus
- Pertussis
- Poliomyelitis
- Measles
- Mumps
- Rubella
- Hepatitis B
- Hepatitis A
- Varicella (chickenpox)

Required vaccines and the number of doses of each vaccine may vary according to grade level. Through the years, additional vaccines have been added to the requirements as new vaccines have become available. These additions are made to keep Oklahoma's regulations current with medical recommendations and practices. The changes and additions to the immunization requirements are listed below in chronological order. Current requirements are summarized in the table on page 9. Other vaccines may be recommended for all children but not required by the school immunization law.

Fall 1990 – Second Dose of MMR

A second dose of MMR (measles, mumps, and rubella vaccine) was added to the requirements starting with children entering kindergarten. This requirement was extended up one grade level every year until 2 doses of MMR were required for all students in grades kindergarten through twelfth grade in the 2002-2003 school year.

Fall 1996 – Five DTP & Four Polio

The DTP and polio requirements for students entering kindergarten, or entering first grade without attending kindergarten, were revised to require five doses of DTP/DTaP and four doses of polio vaccine, instead of three doses of DTP/DTaP and three doses of polio vaccine. This requirement was extended up one grade level each year until 2008 when the requirement reached all grade levels (K-12).

Fall 1998 – Varicella (Chickenpox) Added

One dose of varicella (chickenpox) vaccine was added to the list of required vaccines for children entering kindergarten in the fall of 1998. The requirement was set to extend up one grade level each year until the 2010-2011 school year when it was a requirement for children in all grade levels, kindergarten through twelfth grade. A second dose of varicella vaccine is recommended for all children but it is not required for school in Oklahoma.

Fall 2002 – Four Day Grace Period and Other Changes

A four-day grace period was added to the minimum age for the first dose of any vaccine and to the minimum time intervals allowed between some doses of vaccines. The 4-day grace period allows doses administered 4 days or less before the minimum age or interval to be counted as valid doses. These doses do not have to be repeated. For instance, the minimum age for MMR is one year of age or the first birthday. If a child is born on January 1, 2008 the first dose of MMR will be due on January 1, 2009. If the

child receives MMR on December 28, 29, 30, or 31, 2008 it is a valid dose because it was given within four days before the first birthday. If the child receives MMR on December 27, 2008 or sooner it is not a valid dose and must be repeated. The four-day grace period also applies to doses of vaccine given to children enrolled prior to fall 2002.

All third doses of hepatitis B vaccine administered after January 13, 1998 must have been given on or after the child reached six calendar months of age or older. Children who received the third dose of hepatitis B vaccine prior to January 13, 1998 may have received it before they were six months of age and this is acceptable. This was changed in 2005. See below.

All fifth doses of DTaP administered after January 1, 2003 must be given on or after the child's fourth birthday. If the fifth DTaP is given prior to the fourth birthday, it must be repeated.

All second doses of hepatitis A vaccine administered after January 1, 2003 must be given at least six calendar months after the first dose.

June 2005 – Change in Hepatitis B Vaccine Minimum Interval

The minimum age for the third dose of hepatitis B vaccine was changed from six calendar months of age to twenty-four weeks of age following national recommendations. This minimum age now applies to all children.

May 2006 - Change in Minimum Age for Hepatitis A Vaccine

The minimum age for the first dose of hepatitis A vaccine was changed from two years of age to one year of age following national recommendations. This minimum age now applies to all children in school regardless of when they received their first dose of hepatitis A vaccine.

June 2007 – Specifications for Completing DTaP and Polio Vaccine

Children who have not completed the DTaP series by seven years of age must complete the series with Td and/or Tdap vaccines.

Children who have not started or completed the polio vaccine series by their eighteenth birthday are not required to start or complete the polio vaccines series.

Fall 2011 – Tdap Requirement Added

One dose of Tdap (tetanus, diphtheria, acellular pertussis) vaccine was added as a requirement for students entering the seventh grade. This requirement will be extended up one grade level each year until the 2016-2017 school year when it will be required for all students in grades seven through twelve and will then continue as a requirement for those grades.

The following table lists the common abbreviations of the required vaccines.

ABBREVIATIONS FOR VACCINES REQUIRED FOR SCHOOL

Common Abbreviations	Vaccine/Vaccines
DTP	Diphtheria, tetanus, pertussis vaccine
DTaP	Diphtheria, tetanus, acellular pertussis vaccine
HepB	Hepatitis B vaccine
HepA	Hepatitis A vaccine
IPV	Inactivated polio vaccine
MMR	Measles, mumps, rubella vaccine
MMRV	Measles, mumps, rubella, varicella vaccine
OPV	Oral polio vaccine (No longer used in the U.S.)
Td	Tetanus, diphtheria vaccine
Tdap	Tetanus, diphtheria, acellular pertussis vaccine
VAR, VZV	Varicella vaccine

Appendix C beginning on page 32 has a more complete list of common vaccine abbreviations and vaccine brand names.



The first school vaccination law in the United States was enacted in the city of Boston in 1827 and required children to receive smallpox variolation, an early attempt to vaccinate against smallpox.

VACCINES REQUIRED BY SCHOOL YEAR AND GRADE LEVEL IN OKLAHOMA

SCHOOL YEAR	3 DOSES DTP/DTaP & 3 DOSES POLIO	5 DOSES DTP/DTaP & 4 DOSES POLIO	1 DOSE Tdap	2 DOSES MMR	3 DOSES HEPATITIS B	2 DOSES HEPATITIS A	1 DOSE VARICELLA
1996-1997	1-12	K		K & 6	No Requirement	No Requirement	
1997-1998	2-12	K-1		K-1 & 6-7	7		
1998-1999	3-12	K-2		K-2 & 6-8	K & 7-8	K & 7	K
1999-2000	4-12	K-3		K-3 & 6-9	K-1 & 7-9	K-1 & 7-8	K-1
2000-2001	5-12	K-4		K-4 & 6-10	K-2 & 7-10	K-2 & 7-9	K-2
2001-2002	6-12	K-5		K-5 & 6-11	K-3 & 7-11	K-3 & 7-10	K-3
2002-2003	7-12	K-6		K-12	K-4 & 7-12	K-4 & 7-11	K-4
2003-2004	8-12	K-7	No	K-12	K-5 & 7-12	K-5 & 7-12	K-5
2004-2005	9-12	K-8	Require-		K-12	K-12	K-6
2005-2006	10-12	K-9	ment				K-7
2006-2007	11-12	K-10					K-8
2007-2008	12	K-11					K-9
2008-2009	See next column	K-12					K-10
2009-2010				K-12			K-11
2010-2011					K-12		K-12
2011-2012			7			K-12	
2012-2013			7-8				
2013-2014		K-12	7-9				
2014-2015			7-10				K-12
2015-2016			7-11				
2016-2017			7-12				

By referring to the table above you can determine which vaccines are required for specific grade levels for each school year.

In general, most vaccine requirements are phased-in over a multi-year period to ease the burden on schools, parents, and health care providers. For example, children who entered the seventh grade in the fall of 1997 (see row labeled "1997-1998") were required to have three doses of hepatitis B vaccine or be in the process of receiving the three doses, but children in all other grades were not required to have hepatitis B vaccine. This requirement was extended up one grade level each year and also included kindergartners beginning with the 1998-1999 school year. Then by the 2004-2005 school year it included all grades.

It is the intent of the law that all students, regardless of circumstances, meet the requirements for their grade level. All children transferring from other school districts, all students in a grade due to retention, and all students in transitional levels between these grades are required to have the doses indicated as required for their grade level in the table above.

Annendix 6: Kansas School Entry Requirements

Bureau of Disease Control and Prevention
Curtis State Office Building
1000 SW Jackson, Suite 210
Topeka, Kansas 66612-1274



Kansas Immunization Program
Phone: 877-296-0464
Fax: 785-296-8510
www.kdheks.gov/immunize

Susan Mosier, MD, Secretary

Department of Health & Environment

Sam Brownback, Governor

KANSAS STATUTES RELATED TO SCHOOL IMMUNIZATIONS

K.S.A. 72-5208. Health tests and inoculations; definitions.

As used in this act:

- (a) "School Board" means the board of education of a school district and the governing authority of any nonpublic school;
- (b) "school" means all elementary, junior high, or high schools within the state.
- (c) "local health department" means any county or joint board of health established under the laws of Kansas and having jurisdiction over the place where any pupil affected by this act may reside;
- (d) "secretary" means the secretary of the state department of health and environment;
- (e) "physician" means a person licensed to practice medicine and surgery

History: L. 1961, ch. 354, 1; L. 1978, ch. 291, 1; July 1. K.S.A.

72-5209. Health tests and inoculations; certification of completion required, alternatives; duties of school boards. (a) In each school year, every pupil enrolling or enrolled in any school for the first time in this state, and each child enrolled for the first time in a preschool or day care program operated by a school, and such other pupils as may be designated by the secretary, prior to admission to and attendance at school, shall present to the appropriate school board certification from a physician or local health department that the pupil has received such tests and inoculations as are deemed necessary by the secretary by such means as are approved by the secretary. Pupils who have not completed the required inoculations may enroll or remain enrolled while completing the required inoculations if a physician or local health department certifies that the pupil has received the most recent appropriate inoculations in all required series. Failure to timely complete all required series shall be deemed non-compliance.

(b) As an alternative to the certification required under subsection (a), a pupil shall present:

- (1) An annual written statement signed by a licensed physician stating the physical condition of the child to be such that the tests or inoculations would seriously endanger the life or health of the child, or
 - (2) A written statement signed by one parent or guardian that the child is an adherent of a religious denomination whose religious teachings are opposed to such tests or inoculations
- (c) On or before May 15th of each school year, the school board of every school affected by this act shall notify the parents or guardians of all known pupils who are enrolled or who will be enrolling in the school of the provisions of this act and of any policy regarding the implementation of the provisions of this act adopted by the school board.
- (d) If a pupil transfers from one school to another, the school from which the pupil transfers shall forward with the pupil's transcript the certification or statement showing evidence of compliance with the requirements of this act to the school to which the pupil transfers.

History: L. 1961, ch. 354, 2; L. 1965, ch. 412, 1; L. 1970, ch. 283, 1; L. 1975, ch. 462, 107; L. 1978, ch. 291, 2; L., 1981, ch. 285, 1; L. 1993, ch. 89, 1; L. 1994, ch. 206, 1; July 1.



K.S.A. 72-5210. Same; duties of public health departments and officers; fees, exception to payment.

The county, city-county, or multi-county health department shall provide without delay, and to the extent that funds are available, the tests and inoculations required by this act to such pupils as are not provided therewith by their parents or guardians and who have not been exempted on religious or medical grounds. Such tests and inoculations may be provided on a sliding fee scale for administrative charges, with the exception that no child may be denied inoculations for inability to pay an administrative fee. The local health officer shall counsel and advise school boards concerning the administration of this act.

History: L. 1961, ch. 354, 3; L. 1965, ch. 412, 2; 1978, ch. 291, 3; L. 1980, ch. 182, 30; L. 1994, ch. 206, 2; July 1.

K.S.A. 72-5211. Same; duties of secretary; forms and certificates; regulations.

The secretary shall prescribe the content of forms and certificates to be used by school boards in carrying out this act and shall provide, without cost to the school boards, sufficient copies of this act for distribution to pupils. Schools shall utilize the reporting form adopted by the secretary for documentation of all immunizations. Audit information shall be obtained from this adopted form. The secretary may adopt such regulations as are necessary to carry out the provisions of this act.

History: L. 1961, ch. 354, 4; L. 1975, ch. 462, 108; L. 1978, ch. 291, 4; L. 1994, ch. 206, 3; July 1.

K.S.A. 72-5211a. Exclusion of pupils from school attendance; adoption of policy; notice; hearing; compulsory attendance law not applicable.

(a) The school board of every school affected by this act may exclude from school attendance, or by policy adopted by any such board, authorize any certificated employee or committee of certificated employees to exclude from school attendance, any pupil who has not complied with the requirements of K.S.A. 72-5209. A pupil shall be subjected to exclusion from school attendance under this section until such time as the pupil shall have complied with the requirements of K.S.A. 72-5209. The policy shall include provisions for written notice to be given to the parent or guardian of the involved pupil. The notice shall:

(1) Indicate the reason for the exclusion from school attendance,

(2) State the pupil shall continue to be excluded until the pupil has complied with the requirements of K.S.A. 72-5209, and

(3) Inform the parent or guardian that a hearing hereon shall be afforded the parent or guardian upon request therefore.

(b) The provisions of K.S.A. 72-1111 do not apply to any pupil while subject to exclusion from school attendance under the provisions of this section.

History: L. 1978, ch. 291, 5; L. 1981, ch. 285, 2;

Appendix 7: School Nurse Survey

School Nurse Workforce, Management of Students with Chronic Diseases, Health Screenings, and Immunization Policies KDHE 2017-2018 School Year Survey

The Kansas Department of Health and Environment (KDHE) is conducting a survey of public schools and accredited private schools in the state to study the school nurse workforce, management of students with chronic diseases, health screenings data, and immunization policies.

Unlike past years, we ask that each school district designate **one** individual (school nurse coordinator, lead school nurse, district administrator) to provide the information for the entire school district.

All information provided is confidential. Survey results are presented as summary data only.

Please print the form, collect your data for the school year, and then enter the data. You may enter your survey data until March 23, 2018. If you have questions or have corrections on the data you enter, please contact **Elisa Nehrbass**, Child & Adolescent Health Consultant, Bureau of Family Health, KDHE. (785) 296-1305, Elisa.b.nehrbass@ks.gov.

Thank you very much for your participation.

School Name:

USD Number (if applicable):

County:

Is the staff member completing the survey a RN or LPN?

1. If yes,
 - i. Request name, position title, RN or LPN, and email address
 - ii. Ask if their name and contact information can be shared with KSNO for the purpose of ongoing communication about School Health Services.
 - iii. Follow Track **A, B, D, and E**
2. If no,
 - i. Name, position, and email address of the individual answering the questionnaire
 - ii. Does your district employ any of the following? (check all that apply)
 1. Health Services Director or Coordinator
 2. Lead Nurse
 - iii. Does your school employ or contract with a registered nurse?
 1. If yes Follow Track **A, B, D, and E**
 2. If no, Follow Track **A, C, D, and E**

TRACK A - Who currently is hired or contracted to provide health services in their school district?

1. If RN's – how many full time equivalent (FTE) hired or contracted (specify for each, but do not duplicate FTE in more than one category).

FTE is based on a teacher FTE in the district. For example, if a teacher is contracted for 7.5 hours per day and the RN is contracted/hired for 7.5 hours per day it would be 1 FTE, even if the RN regularly stays later. If the RN is 4 hours per day, it would be 4 divided by 7.5 equaling 0.53 FTE. If the district has 2 RNs and each is 0.53, it would be reported as 1.06 FTE.

Direct services means responsible for the care of defined group of students in addressing their acute and chronic health conditions. It includes health screenings, health promotion and case management. Direct services also include care provided in a health care team including LPNs or aides.

- a. With assigned caseload providing direct services
 - b. Supplemental/float providing direct services
 - c. Providing administrative or supervisory services, not regularly serving students
 - d. Limited caseload providing direct services to medically fragile students such 1:1, 1:2, 1:3, etc.
2. If LPN's – how many FTE? Hired or contracted (specify for each, but do not duplicate FTE in more than one category)
 - a. With assigned caseload providing direct services
 - b. Supplemental/float providing direct services
 - c. Providing administrative or supervisory services, not regularly serving students
 - d. Limited caseload providing direct services to medically fragile students such 1:1, 1:2, 1:3, etc.
3. If non-licensed staff – how many FTE? Hired or contracted (specify for each, but do not duplicate FTE in more than one category)
 - a. With assigned caseload providing direct services *Exclude secretaries, teachers or principals who only address health issues at times. You may include FTE of secretary or other aides IF it is included as a specific part of their responsibility (i.e. cover health office regularly).*
 - b. Supplemental/float providing direct services
 - c. Providing administrative support (e.g. secretarial to a nursing administrator)

TRACK B

1. **Definitions:**

IHP = Individualized Healthcare Plan

ECP/EAP= Emergency Care Plan/Emergency Action Plan

Medical Home-refers to a team-based health care delivery model. Skilled and knowledgeable health care professionals, acting as a team with the student and the parent or legal guardian, continuously monitor the child's health status over time and their medical and non-medical care needs.

For each condition select the category that best describes your district's ability to identify and care for students with these conditions. Students with this chronic condition at my district are...

2. Are any of the following strategies implemented in your school district to support student health?

3. Number of students with an **asthma** diagnosis

4. Number of students with **Type 1 Diabetes** diagnosis

5. Number of students with **Type 2 Diabetes** diagnosis

6. Number of students with a **seizure** disorder diagnosis

7. Number of students with **Food Allergies & Anaphylaxis** diagnosis

8. Do the above numbers reflect the entire student body? If no, number of students represented?

9. How many times were the following medications administered in your school district this past year:

a. Epinephrine

i. None

ii. One time

iii. 2 to 5 times

iv. 6 or more times

v. Don't know

b. Glucagon

i. None

ii. One time

iii. 2 to 5 times

iv. 6 or more times

v. Don't know

c. Rescue Seizure Medications (diazepam, midazolam, lorazepam, clonazepam)

i. None

ii. One time

iii. 2 to 5 times

iv. 6 or more times

v. Don't know

TRACK C

1. Definitions:

IHP = Individualized Healthcare Plan

ECP/EAP= Emergency Care Plan/Emergency Action Plan

Medical Home-refers to a team-based health care delivery model. Skilled and knowledgeable health care professionals, acting as a team with the student and the parent or legal guardian, continuously monitor the child's health status over time and their medical and non-medical care needs.

For each condition select the category that best describes your districts ability to identify and care for students with these conditions. Students with this chronic condition at my district are...

2. Do you have students with medications orders to treat:
 - Asthma (yes/no)
 - ADHD (yes/no)
 - Food Allergies & Anaphylaxis (e.g. epinephrine) (yes/no)
 - Type 1 diabetes (yes/no)
 - Seizure Disorder (yes/no)
3. Do any of the above students have emergency action plans?
 - If yes who writes the emergency action plans?
 - If yes who provides their training?
4. Are any of the following strategies implemented in your school district to support student health?
5. How many times were the following medications administered in your school district this past year:
 - a. Epinephrine
 - i. None
 - ii. One time
 - iii. 2 to 5 times
 - iv. 6 or more times
 - v. Don't know
 - b. Glucagon
 - vi. None
 - vii. One time
 - viii. 2 to 5 times
 - ix. 6 or more times
 - x. Don't know
 - xi.
 - b. Rescue Seizure Medications (diazepam, midazolam, lorazepam, clonazepam)
 - i. None

- ii. One time
- iii. 2 to 5 times
- iv. 6 or more times
- v. Don't know

Would you be interested in a regional nursing corps to assist with training and care of students? Yes or No *For example, a regional nursing corps could include direct registered nursing services and regional nurse administrative consultation and technical assistance placed strategically across the state to support student health and safety.*

Track D Health Screenings

A. This school year, KDHE is seeking information related to grade levels regularly screened for vision, hearing, and BMI.

We acknowledge that many school districts will screen new-to-district students and students with an IEP no matter the grade level. Indicate below the grade levels where all of the students are regularly screened.

1. **Hearing Screening** (repeat question for Vision Screening and BMI) **is performed on the following grade levels in our school district (select all that apply):**

Early childhood – 3 year olds

Early childhood – 4 year olds

Early childhood – 5 year olds

Kindergarten

Grade 1

Grade 2

Grade 3

Grade 4

Grade 5

Grade 6

Grade 7

Grade 8

Grade 9

Grade 10

Grade 11

Grade 12

Comment:

• **Who performs the above screening in your district (select all that apply)?**

Audiologist

School Nurse

Unlicensed Assistive Personnel (e.g. school aides/paras, etc.)

Volunteers

Contracted through another agency (e.g. county health department, special services cooperative agency)

Other (please list)

- The ***Kansas Hearing Screening Guidelines and Resource Manual*** defines a Hearing Screening Technician as any person trained by a Kansas licensed audiologist to conduct hearing screenings. **Have all, some or none of the individual(s) conducting hearing screenings in your school completed this training requirement?**

All

Some

none

2. Vision Screening is performed on the following grade levels in our school district (select all that apply):

Early childhood – 3 year olds

Early childhood – 4 year olds

Early childhood – 5 year olds

Kindergarten

Grade 1

Grade 2

Grade 3

Grade 4

Grade 5

Grade 6

Grade 7

Grade 8

Grade 9

Grade 10

Grade 11

Grade 12

Comment:

- **Who performs the above screening in your district (select all that apply)?**

School Nurse

Unlicensed Assistive Personnel (e.g. school aides/paras, etc.)

Volunteers

Contracted through another agency (e.g. county health department, special services cooperative agency)

Other (please list)

- **Have all, some or none of the individual(s) conducting the vision screening completed a vision screening certification training?**

All

Some

none

3. Oral Health Screening is performed on the following grade levels in our school district (select all that apply)

Early childhood – 3 year olds

Early childhood – 4 year olds

Early childhood – 5 year olds

Kindergarten

Grade 1
Grade 2
Grade 3
Grade 4
Grade 5
Grade 6
Grade 7
Grade 8
Grade 9
Grade 10
Grade 11
Grade 12

• **Who performs the above screening in your district (select all that apply)?**

Dentist

Registered Dental Hygienist

Other:

4. **Body Mass Index Screening (BMI) is performed on the following grade levels in our school district (select all that apply):**

Early childhood – 3 year olds

Early childhood – 4 year olds

Early childhood – 5 year olds

Kindergarten

Grade 1

Grade 2

Grade 3

Grade 4

Grade 5

Grade 6

Grade 7

Grade 8

Grade 9

Grade 10

Grade 11

Grade 12

Comment:

• **Who performs BMI screening in your district (select all that apply)?**

School Nurse

Physical Education teacher

Unlicensed Assistive Personnel (e.g. school aides/paras, etc.)

Volunteers

Contracted through another agency (e.g. county health department, special services cooperative agency)

Other (please list)

B. During the PAST school year (2016-2017), how many students in your school district were referred following a health screening and how many of these students were subsequently seen by a health care professional (including preschoolers)? Leave blank if last school year's numbers are not available.

1. Total number of student screened in 2016-2017 (Please do not include rescreenings):
Vision:
Hearing:
Oral Health:
BMI:
2. Number of students who were referred to providers/health care professionals in 2016-2017:
Vision:
Hearing:
Oral Health:
BMI:
3. Number of completed referrals in 2016-2017 (students who actually saw a provider for evaluation for vision or hearing deficits):
Vision:
Hearing:
4. Did you calculate student's body mass index (BMI) in 2016-2017? ☐yes ☐no
5. If BMI was calculated, please provide the number of students in each of the following percentiles (Please do not include repeat calculations):
 - vi. Less than 5th Percentile
 - vii. 5th to 84th Percentile
 - viii. 85th to 94th Percentile
 - ix. 95th Percentile of Greater

Track E – Immunization Policy questions

Note to survey facilitators: September 20th count will be obtained from KSDE to provide the student number count for each school district.

DRAFT Questions Regarding IKC Model School Immunization Exclusion Policy for 2017-2018 KDHE School Nurse Survey

*****Revision date: 2018-01-09*****

Section Heading: School Exclusion Policy Regarding Immunization

Kansas state law requires students enrolled in school to be immunized with vaccines designated by the Kansas Department of Health and Environment (KDHE), allowing exemptions on medical or religious grounds (K.S.A. 72-5209 *et seq.*). Local school boards and governing authorities of nonpublic schools are authorized to exclude students who have not been vaccinated according to the requirements (K.S.A. 72-5211a).

1. In July 2016, the Immunize Kansas Coalition (IKC) – a group of Kansas providers, health department officials, researchers and educators working together to improve vaccine rates and protect Kansans against vaccine-preventable diseases – distributed a model school immunization exclusion policy to all school nurses in Kansas. The letter and model policy are posted on the

Immunize Kansas Coalition website at <http://www.immunizekansascoalition.org/schools.asp>. Do you recall receiving this information?

- a. Yes
 - b. No
2. Does your district have a written immunization exclusion policy?
 - a. Yes
 - b. No [Skip to question 5]
 - c. Not sure [Skip to question 5]
3. When was your district's immunization exclusion policy adopted?
 - a. _____ (month/year)
4. Did your district either adopt or revise its immunization exclusion policy in response to receiving the IKC Model Policy?
 - a. Yes
 - b. No
 - c. Not sure
5. Next, we would like to learn more about your district's policy or practices. With or without a grace period, does your district exclude students who have not received the required immunizations and who do not have a medical or religious exemption?
 - a. Yes
 - b. No [Skip to Q7]
 - c. Not sure [Skip to Q7]
6. Outside of a grace period, does your district allow for exceptions to excluding students, either informally (e.g., case by case basis) or by policy (e.g., parents or guardians sign a statement that they understand the risks, etc.)?
 - a. Yes
 - b. No
 - c. Not sure
7. According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded? Please select the option that most closely matches your school's grace period.
 - a. No grace period; students must be up to date on the first day of school
 - b. 30 days or four weeks after first day of school
 - c. 45 days or six weeks after first day of school
 - d. 60 days or eight weeks after first day of school
 - e. 90 days or 12 weeks after first day of school
 - f. First day of second semester
 - g. Specific exclusion date: (MM/DD/YYYY)
 - h. Other (please specify):
8. Does your district intend to modify its immunization exclusion policy in the next 12 months?
 - a. Yes
 - b. No [Skip to Q10]
 - c. Not sure [Skip to Q10]
9. What are the primary reasons why your district intends to modify its immunization exclusion policy?
 - a. [Open-ended]: _____
10. Please provide any additional comments regarding your district's immunization exclusion policy:
 - a. [Open-ended]:

Appendix 8: Immunize Kansas Model Exclusion Policy

Model School Exclusion Policy

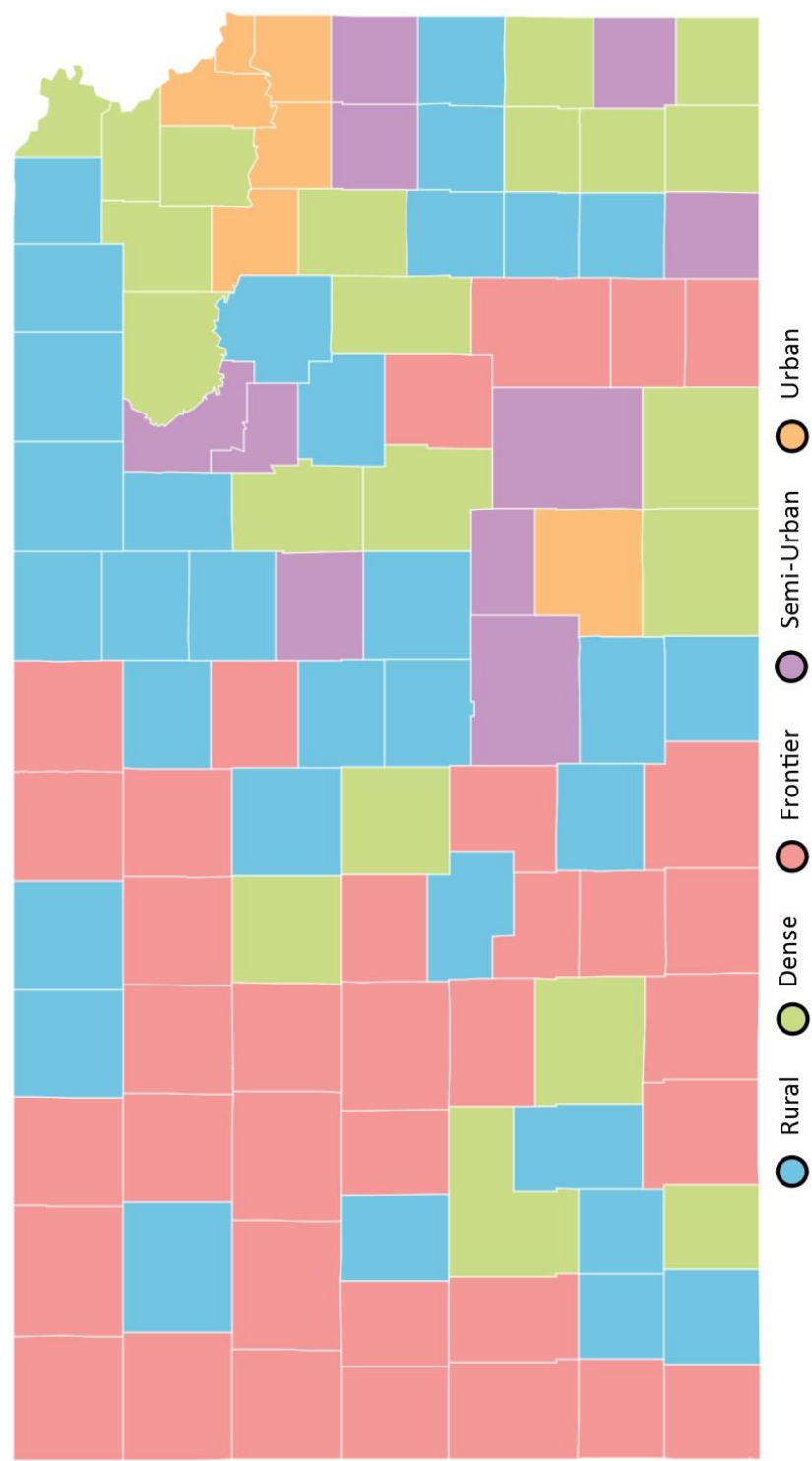
BOARD POLICY:

The lawful custodian of every enrolled or enrolling student shall be required to present proof of immunization in accordance with KSA 7252085211 and KAR 28120 to appropriate school officials.

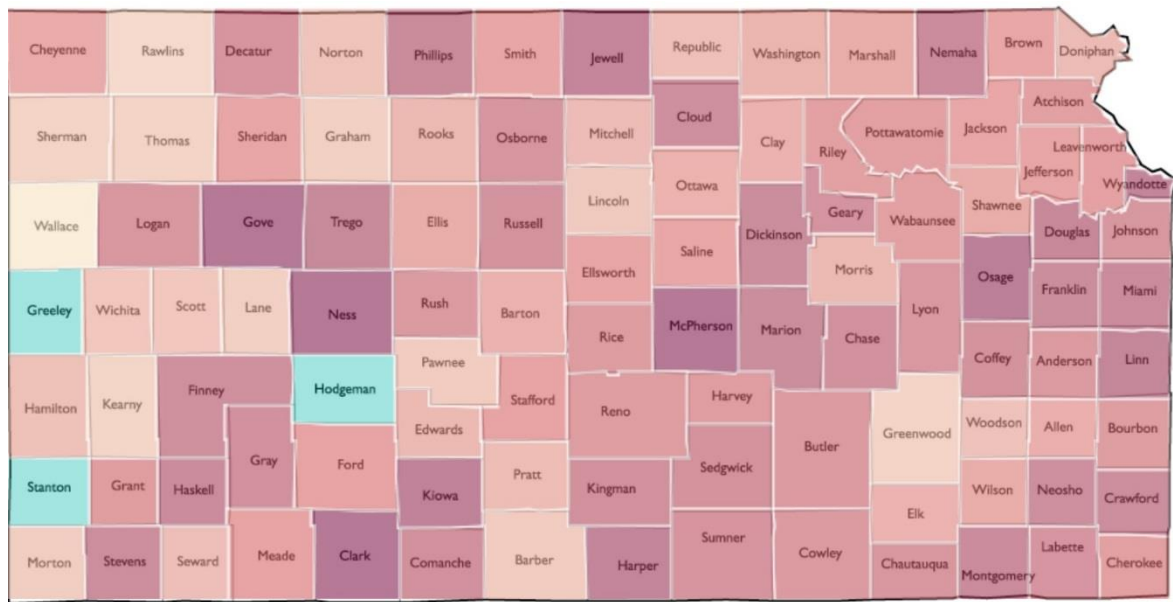
ADMINISTRATIVE PROCEDURE:

1. In each school year, every pupil enrolling in any Kansas public school for the first time, prior to admission to and attendance at school, shall present to the appropriate school board certification from a physician, local health department, or transferring school district that the pupil has received at least one of each required immunization per age and grade as determined by Kansas Department of Health and Environment (KDHE), with the most recent appropriate immunizations in all required series received by [six weeks after the student's enrollment date]. Failure to timely complete all required series shall be deemed noncompliance.
2. As an alternative to the immunizations required a pupil shall present: An annual written statement signed by a licensed physician stating the physical condition of the child to be such that the tests or immunizations would seriously endanger the life or health of the child, or a written statement signed by one parent or guardian that the child is an adherent of a religious denomination whose religious teachings are opposed to such tests or immunizations.
3. The school will utilize the reporting form adopted by the KDHE Secretary or electronic approved method for documentation of all immunizations. The form, when used, shall be signed by a physician, health department representative, or USD [###] school nurse and stored in the pupil's cumulative health folder.
4. On or before May 15, the school shall notify in writing the parents or guardians of the following school year's immunization requirements. Official healthcare provider documents may be utilized to update vaccination records of currently enrolled students.
5. Any pupil who does not comply with the above immunization requirements **shall** be excluded from school. Prior to each exclusion deadline, written notice regarding the policy and required immunizations will be provided to the parent. The exclusion date will be [six weeks after the student's enrollment date].
6. Any pupil claiming any legal alternatives listed under 2 above shall be subject to exclusion from school in the event of a vaccine preventable disease outbreak.
7. The [School Nurse or District School Nursing Department] will:
 - A. Provide principals with information concerning the immunizations required by the Secretary of Health and Environment
 - B. Enter immunization data in the computerized data base and submit reports to appropriate local and state authorities related to student compliance;
 - C. Prepare notification letters to lawful custodians of pupils needing immunizations;
 - D. Provide a legible copy of the KCI or electronic record to the lawful custodian when requested for pupils who are transferring outside the district; and
 - E. At the beginning of a school year, provide information on immunizations applicable to school age children to parents and guardians in accordance with KSA 725215.
8. The provisions of K.S.A. 721111 do not apply to any pupil while subject to exclusion from school attendance under the provision of this section. Waiving of exclusion due to immunization noncompliance as authorized by other superseding legislation will be honored.

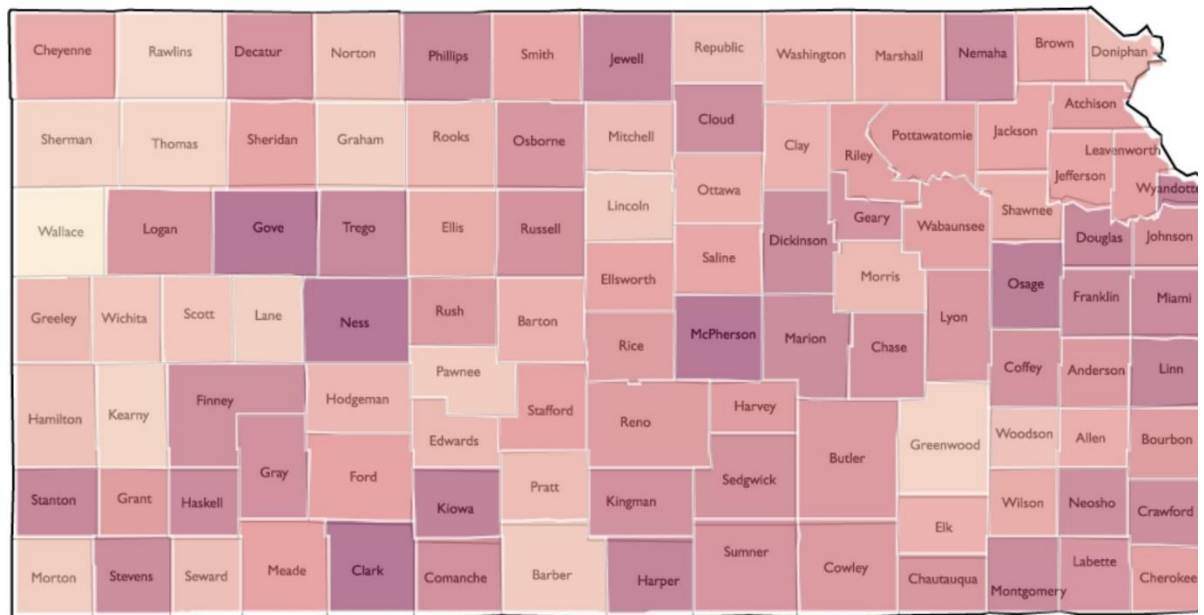
Appendix 9: Map of Population density for Kansas



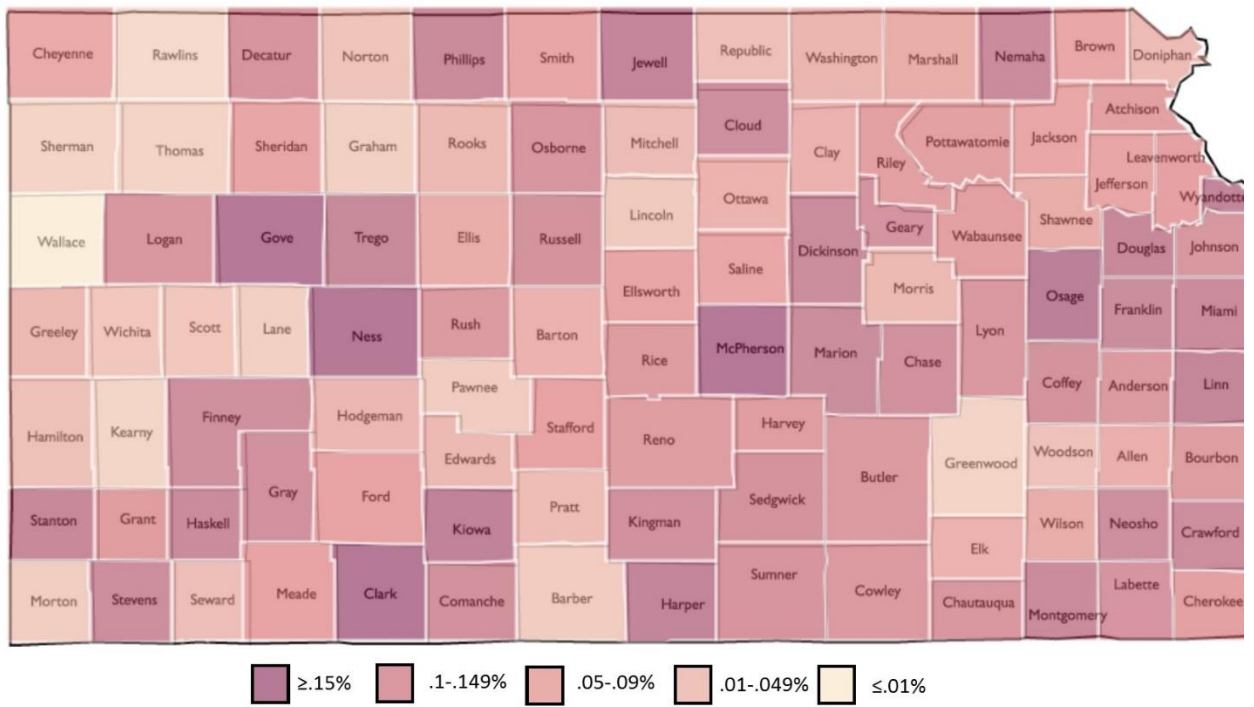
Appendix 10: Exclusion Maps 2014-2016



2014-15 School Year Percent of Kansas Kindergartners that should be excluded



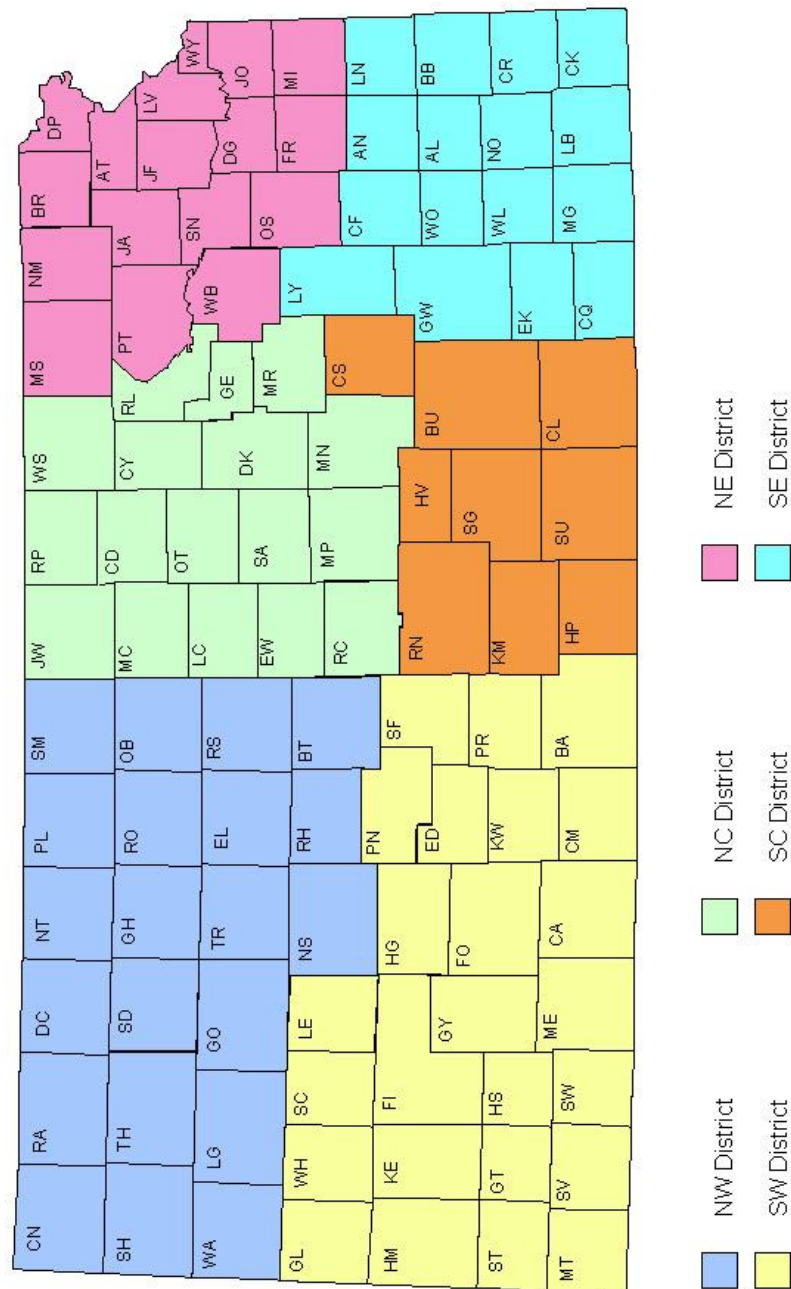
2015-16 School Year Percent of Kansas Kindergartners that should be excluded



2016-17 School Year Percent of Kansas Kindergartners that should be excluded

Appendix 11: KDHE Region Maps

KDHE District Office Boundaries



Source: KDHE Division of Environment – Bureau of Waste Management
Prepared by Bureau of Epidemiology and Public Health Informatics

Appendix 12: IRB Exemption

Kansas Department of Health and Environment
Institutional Review Board

NEW PROJECT REQUEST

Date: January 19th, 2018

Name of project: 2017-2018 School Nurse Survey

Type of Application: ☐ New/Renewal ☐ Revision (to a pending new application)
☐ Modification (to an existing # _____ approved application)

Name of investigator: Elisa Nehrbass Phone number: 785-296-1305

Bureau and agency: BFH-Children and Families Email: Elisa.B.Nehrbass@ks.gov

Name of co-investigator: Jennifer Church Phone number: 785-296-6801

Bureau and agency: BHP Email: Jennifer.church@ks.gov

Name of co-investigators: Charlie Hunt Phone number: 785-233-5443
Jennifer McDonald (student intern)

Bureau and agency: Kansas Health Institute Email: chunt@khi.org

Have you reviewed Parts I and II the OHRP tutorial on human subjects protection found at <http://www.hhs.gov/ohrp/education/training/introduction.html>? ☐ Yes ☐ No

What are you requesting? ☐ Board Review ☐ Exemption

(Only the IRB has the authority to determine that a project is exempt from IRB review)

If requesting exemption, which exemption are you claiming for the project:

(List of exemptions can be found at <http://www.hhs.gov/ohrp/policy/checklist/decisioncharts.html>)

☐ Exemption CFR 46.101 (b)(1) For Educational Settings

☐ Exemption CFR 46.101 (b)(2) or (b)(3) Tests, Surveys, Interviews, Public Behavior Observation

☐ Exemption CFR 46.101 (b)(4) Existing Data Documents and Specimens

☐ Exemption CFR 46.101 (b)(5) Public Benefit or Service Programs

☐ Exemption CFR 46.101 (b)(6) Food Taste and Acceptance Studies

☐ Exemption Approval from another IRB?

If yes, please provide the IRB name and protocol number for this specific project and attach documentation of project approval.

IRB Name:

Protocol Number:

Does the project enroll or collect data from any of the following: **No**

☐ Children - Under 18 years of age (these subjects require parental or guardian consent)

☐ Over 65 years of age

☐ Physically or mentally disabled

☐ Economically or educationally disadvantaged

☐ Unable to provide their own legal informed consent

☐ Pregnant females as target population

☐ Victims

☐ Subjects in institutions (e.g., prisons, nursing homes, halfway houses)

Will you be collecting personal identifiers? ☐ Yes ☐ No

Personal identifiers include any of the following: name, address, phone number, person number (e.g., SSN, hospital number), or anything that can be linked to an identifier.

Will data be collected that might be reasonably considered sensitive? ☐ Yes ☐ No

Sensitive data would include but not be limited to the following: drug or alcohol use, sexual behavior, victimization or abuse, criminal activity, mental illness.

Will the protocol require anything besides participant provision of information? ☐ Yes ☐ No
(e.g., specimen collection, physical examination, treatment)

Risk Protection Benefits: The answers for the three questions below are central to human subject research. You must demonstrate a reasonable balance between anticipated risks to research participants, protection strategies, and anticipated benefits to participants or others.

Risks for Subjects (Identify any reasonably foreseeable physical, psychological, or social risks for participants. State that there are “no known risks” if appropriate): **No known risks.**

Minimizing Risk (Describe specific measures used to minimize or protect subjects from anticipated risks.)

Benefits (Describe any reasonably expected benefits for research participants, a class of participants, or to society as a whole.) **The data would support school nurses in their effort to improve the health and academic success of all Kansas students. The assessment results will provide KDHE with information to develop targeted programs that support school nursing practice.**

In your opinion, does the research involve more than minimal risk to subjects? (“Minimal risk” means that “the risks of harm anticipated in the proposed research are not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.”)

☐ Yes ☐ No

Please attach a brief narrative description of the proposed project (no longer than one page), in terms that will allow the IRB or other interested parties to clearly understand what it is that is proposed to do that involves human subjects. This description must be in enough detail so that the IRB members can make an informed decision about the proposal.

☐ Yes Attachment Included (on the following page) ☐ No Attachment

☐ Attach a copy of the written research protocol.

☐ Attach a copy of the grant application that will or is funding the research project.

Are you using a written informed consent form?

☐ Yes – Include a copy with this application

☐ A waiver or alteration of informed consent elements – Include a copy of alternatives

☐ No

☐ Attach a copy of data collection instruments.

☐ Attach a copy of documents to be used in participant recruitment (marketing/promotion)

Other documents may be required by the Board and must be included in this application.

Title of the Project: Kansas 2017-2018 School Nurse Survey

Description of the Project:

The purpose of the project is two-fold.

First, this project is to assess the school nurse workforce, management of students with chronic diseases, and health screenings data. The data would support school nurses in their effort to improve the health and academic success of all Kansas students. KDHE-BFH has previously conducted a school nurse survey every year and included information about the demographics of school nurses and their practice. There was a 2-year period of time when the survey was not administered due to vacancy of Child and Adolescent Health Consultant position. This year, that position has been filled and the intent is to conduct this survey on an annual basis. The assessment results will provide KDHE with information to develop targeted programs that support school nursing practice.

Second, the project is to evaluate the potential impact of the Immunize Kansas Coalition (IKC) model school immunization exclusion policy (available at <http://www.immunizekansascoalition.org/schools.asp>), which was disseminated in July 2016. Kansas state law requires students enrolled in school to be immunized with vaccines designated by KDHE, allowing exemptions on medical or religious grounds (K.S.A. 72-5209 *et seq.*). Local school boards and governing authorities of nonpublic schools are authorized to exclude students who have not been vaccinated according to the requirements (K.S.A. 72-5211a).

The survey will be administered online and invitations to complete the survey will be sent by email to the point of contact of school district RN, LPN, or non-licensed staff gathered by Elisa Nehrbass (BFH). The initial email will provide detailed information about the purpose and goals of this survey and include a link for participants to access the survey. The survey will be administered online via Qualtrics. Participants will have four weeks to complete the survey with bi-weekly reminder emails (two emails during the survey period). After four weeks, Cindy Galemore and Chris Tuck (School Nurse Advisory Council members) will telephone non-responding school districts. The purpose of the calls is to ensure that all survey materials were received or determine if there were issues completing the survey. There will be no non-respondent participant interviews to complete the survey over the phone.

Informed consent is included at the beginning of the survey. Potential respondents must click “Next” in acknowledgement of the consent statement before they are able to proceed to the survey questions. Survey responses will be kept confidential and only reported in aggregate

unless explicit permission to share contact information is provided. Jamie Kim, Maternal and Child Health Epidemiologist, will have access to the Qualtrics account and survey data. The entire record level data will be shared with the co-investigators and will be stored in a password-protected shared drive at BFH, BHP and KHI. Only the staff involved will have access to it: BFH (i.e, Elisa Nehrbass and Jamie Kim); BHP (i.e., Jennifer Church, Belle Federman, Emily Carpenter and Warren Hays); and KHI (Charlie Hunt and Jennifer McDonald).

Appendix 13: IKC Presentation




Policy Review: School Exclusion Policy for Nonvaccinated Students

Introduction

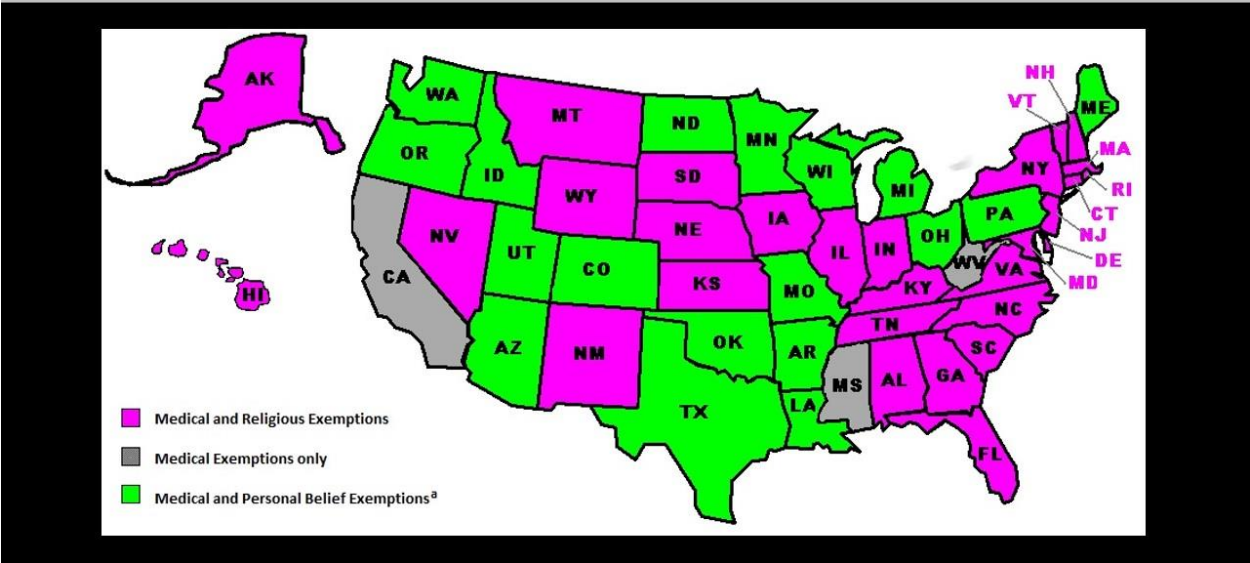
- One of the roles of government is to protect the populace by enacting policies for the greater good
 - Mandatory vaccinations for school entry are one of those policies
- 1800's Smallpox
 - 400,000 were dying annually in Europe
 - 30% mortality rate
 - Edward Jenner's vaccine
 - Mandatory vaccination
 - Victim of its own success
 - Fear of vaccine safety
 - Rise of Anti Vaccination Leagues

US Legislation

- *Jacobson v the State of Massachusetts* 1905
 - **Case:** Mandatory vaccination violates civil liberties
 - **Ruling:** The state has the right to impose mandatory vaccination if it is for the benefit of the community
- 
- A wooden gavel with a light-colored handle and a dark head rests on a stack of papers. In the foreground, a wooden block with the word 'REGULATIONS' is visible. To the right, another wooden block with the word 'RULES' is partially visible. The scene is set against a dark background.



Exemptions



Kansas Statute



- Kansas state law requires students enrolled in school to be immunized with vaccines designated by the Kansas Department of Health and Environment (KDHE)
 - Allows for exemptions on medical or religious grounds (K.S.A. 72-5209 *et seq.*).
- Local school boards and governing authorities of nonpublic schools are authorized to exclude students who have not been vaccinated according to the requirements (K.S.A. 72-5211a).
 - Each district/governing body has the ability to create their own policies regarding exclusion at the individual level
 - As a result these policies vary greatly from district to district

- In July 2016, the Immunize Kansas Coalition (IKC) – a group of Kansas providers, health department officials, researchers and educators working together to improve vaccine rates and protect Kansans against vaccine-preventable diseases – distributed a model school immunization exclusion policy to all school nurses in Kansas.

- Written school policy
- Exclusion date 6 weeks after enrollment date



**IMMUNIZE
KANSAS
COALITION**



- Kansas State University
 - BS Anthropology and Archaeology
 - MS Public Health (Spring 2018)
- Field Experience
 - Kansas Health Institute
 - Charlie Hunt

Jeni McDonald

Methods

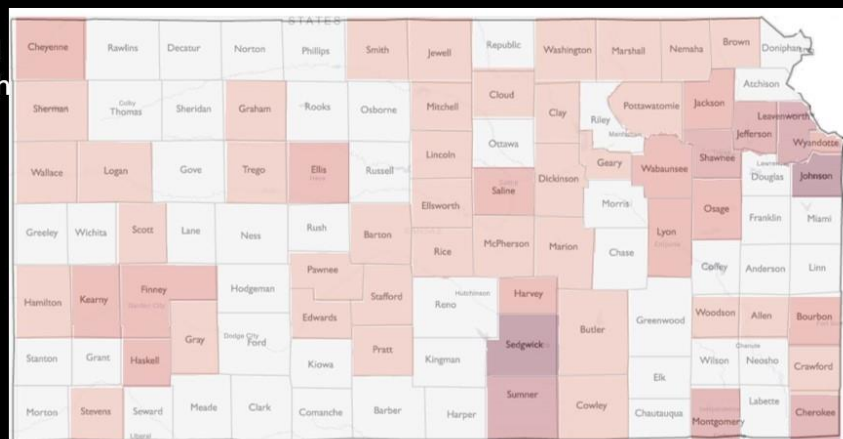
- Literature review to understand policies of Kansas and surrounding states
- Qualtrics Survey emailed to Health Coordinator for each district
- Primary sources were KDHE Kindergarten Immunization Survey and School Nurse Survey
 - Total of 8 questions
- Results are reported by population density groups: Frontier, Rural, Dense Rural, Semi Urban and Urban
- Results are also reported by KDHE district regions: Northwest, Southwest, North Central, South Central, Northeast and Southeast

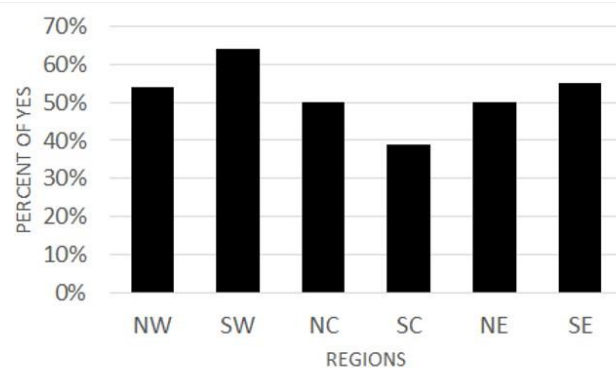
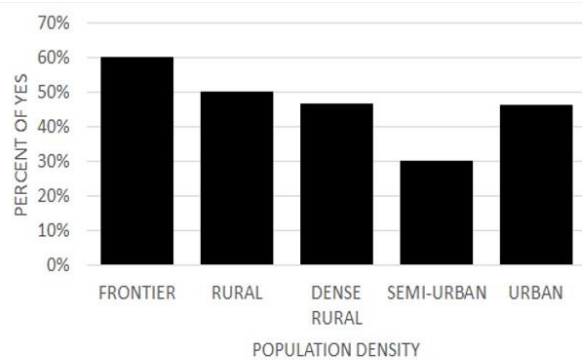
School Nurse Survey- Background

- Annually, KDHE sends out a school nurse survey
 - There had been a lapse in this being sent for 2 years
 - Survey of public schools and accredited private schools in the state
 - To study the school nurse workforce
 - Management of students with chronic diseases
 - Health screenings data
 - Immunization policies
 - Added to this section were questions about:
 - IKC's model policy
 - Grace periods
 - Exclusion policies



- 25% of Districts responded in full to the Survey by March 30th
- 30% Public Schools 11% Private
- Due to low return rate from Private schools further data will be reported by District Regions or Population Density

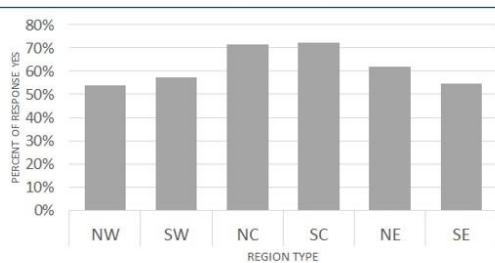
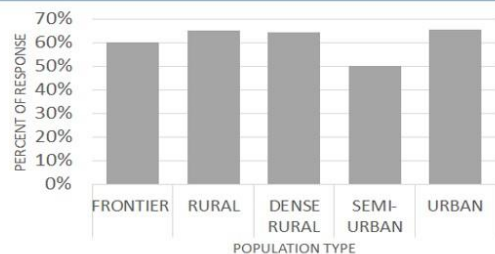




- 49% YES
- 51% NO
- (n=99)

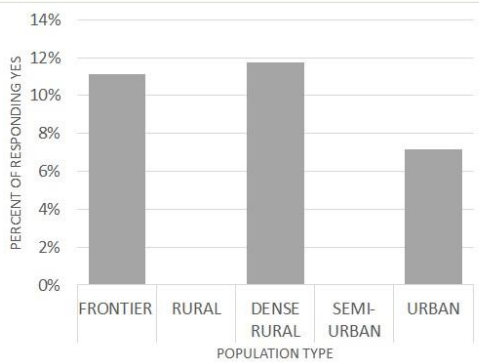
Do you recall seeing the IKC Policy sent out July of 2016?

Does your district have a written immunization exclusion policy?
63% YES 23% NO 14% UNSURE (n=99)



When was your district's immunization exclusion policy adopted? (n=33)

- Prior to 1989: 13% (4)
- 1990 – 1999: 10% (3)
- 2000-2009: 20% (6)
- 2010-2014: 20% (6)
- 2015 or later: 37% (11)



Did your district either adopt or revise its immunization exclusion policy in response to receiving the IKC Model Policy?

7% (4) YES

59% (34) NO
(n=58)

34.5% (20) UNSURE

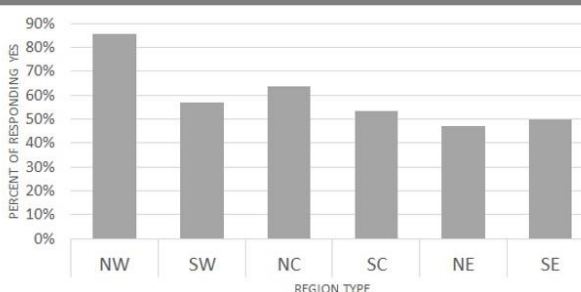
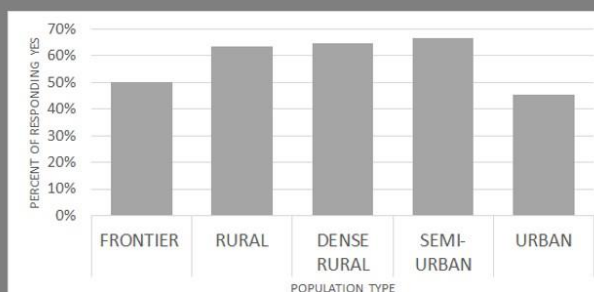
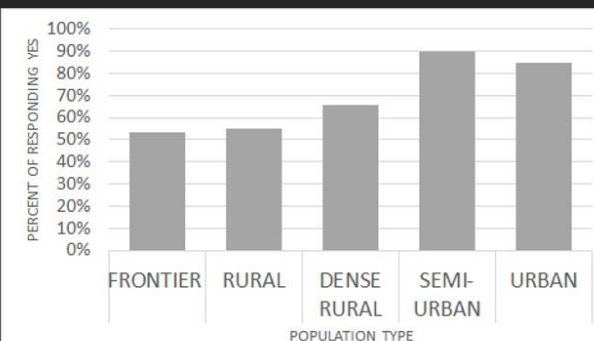
With or without a grace period, does your district exclude students who have not received the required immunizations and who do not have a medical or religious exemption?

69% (67) YES

27% (26) NO

4%(4) UNSURE

(n=97)



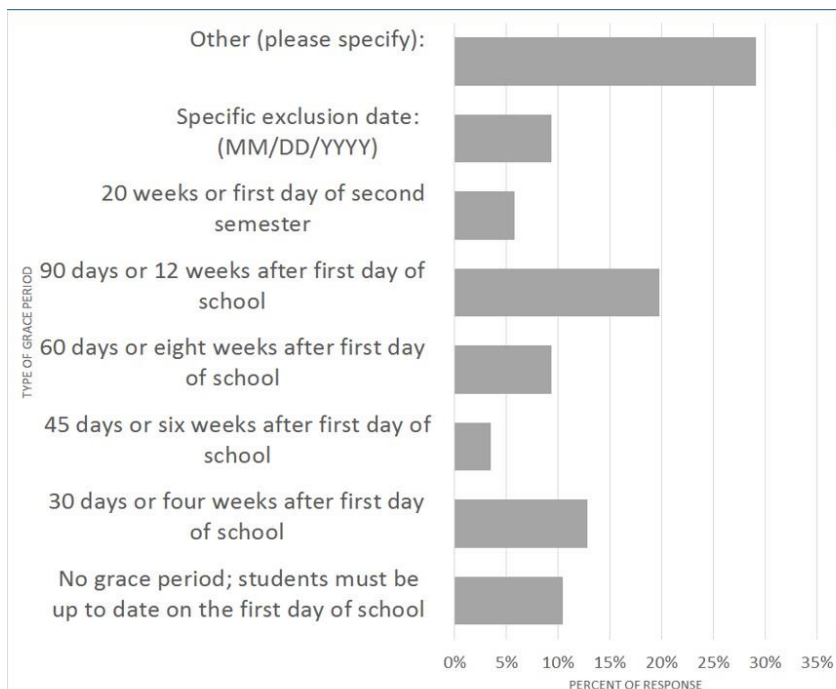
Outside of a grace period, does your district allow for exceptions to excluding students, either informally (e.g., case by case basis) or by policy (e.g., parents or guardians sign a statement that they understand the risks, etc.)?

57% (38) YES

34% (23) NO

9% (6) UNSURE

(n=67)



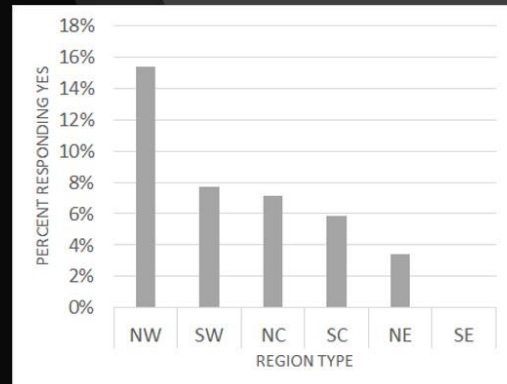
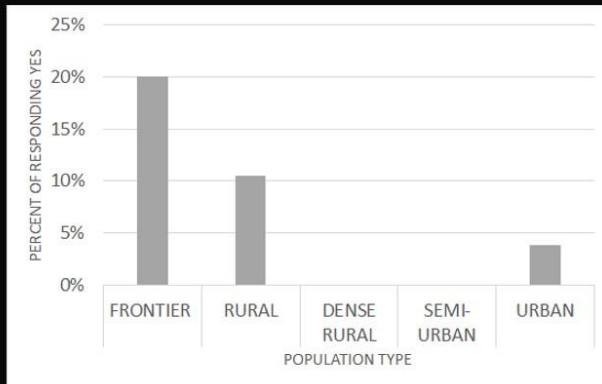
According to either your district's written policy or informal practice, how long is the grace period for students to begin receiving required immunizations before they are excluded? (n=86)

Respondents replying 'other' to grace period (n=25)

- 48% (12) indicated that they do not exclude, so there was no need for an exclusion policy,
 - 59% (7) send reminders to parents to get children up to date on immunizations,
 - 8% (1) indicated they were all up to date,
 - 8% (1) did not exclude because it was more important to have students in school.
 - 25% (3) indicated they only excluded if there is a disease outbreak and they student is not immunized.
- 36% (9) indicated that they exclude during the month of October.
- 8% (2) determine their exclusion date by when the principal, or school nurse decide of the individual school.
- 4% (1) indicated the students must be up to date by the end of the first semester.
- 4% (1) indicated they had 7 days from enrollment.

Does your district intend to modify its immunization exclusion policy in the next 12 months?

6% (6) YES 49.5% (48) NO 44% (43) UNSURE (n=97)



Why change the district policy?

(n=6)



33% (2) responded they were changing the policy as the current policy was not being followed.



17% (1) wanted to change the policy to allow students to stay in school when doctor's appointments exceeded the exclusion date.



17% (1) will change the policy to follow recommendations.



17% (1) will change the policy to put a specific date in it.



17% (1) are changing the policy by putting one in place.

Discussion



- Exclusion policies support school districts in the event of a vaccine preventable outbreak by providing a consistent message.
- Grace periods within the first 6 weeks of school are good incentives to ensure immunization or documentation
- 43% of policies haven't changed since 2000
 - There is no major indicator there is a plan to change these policies
- 39% of grace periods are after 60 days
- Frontier and Rural counties indicate they are less likely to exclude than Semi-Urban or Urban counties
- 57% indicate they allow exceptions to exclusion on case by case basis
 - Decreasing consistency



Questions?
Contact:
ozchild@ksu.edu